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TWO SHILLINGS
AND SIXPENCE



JANUARY LANDSCAPE

Photographic Alliance Print Competition

ALBERT BARRACLOUGH, F.R.P.S.



Baghdad

FROM THE PERSIAN GULF TO THE CASPIAN SEA

By R. Gorbold, F.R.P.S., F.R.G.S.

The opening lecture of the Winter Session, 1942-43, of the Leicester and Leicestershire Photographic Society was given at a joint meeting with The Royal Photographic Society on October 6th, by Mr. R. Gorbold, F.R.P.S., who gave a fascinating account of travels—with a camera—in Irak and Iran.

The chair was occupied by the President of the Leicester and Leicestershire Photographic Society, Mr. E. Tyler.

AS Irak and Iran are much in the news at the present time and may be still more before long, it might be interesting if I told you what I know of these two countries. Truly it is twenty-odd years since I had personal knowledge of them, and they may have changed since those days, but I think the change is only superficial, seeing that they altered very little in the previous 2,000 years.

The photographs were all taken with a V.P.K., which is certainly not the precision miniature instrument of to-day, and the conditions for developing while on service, with the thermometer often standing at 120 degrees or more in the shade, were far from ideal.

Basra is the natural gateway for Irak. It is about 60 miles up the Shat-el-Arab, which carries the combined waters of the Tigris and the Euphrates to the head of the Persian Gulf. Sinbad the Sailor made Basra

famous, for it was his home port. Actually Ashar is on the river front, and has been called the "Venice of Asia," an illusion which disappears when the tide goes out. Up the muddy creek the Arabs, clad in flowing robes, pole their bellums, gondola-like craft, with surprising speed and grace among the mahaylas that sail up the river and the dhows that plough the sea.

Basra, where the date palms flourish, has a very hot, sticky climate, and one does not wish to stay long in that limp atmosphere when one's clothes are never dry, so the prospect of starting for Baghdad was welcome. It was a long, slow journey up the river by barge behind a tug, close on 500 miles of twists and turns with nothing but desert to see day after day, not a hill of any sort, not a rock as big as a pebble, was visible. All great rivers are the highways of the world, and this is no exception.

The stately mahaylas sail when the wind is favourable, or are towed along by the crew, a task that makes a galley slave's occupation sedentary by comparison. There were shallow-draft steamers that have now possibly disappeared in favour of the railway, and sundry other strange ships. The quffeh is quite the most ancient form of craft in the world. It is a round reed basket covered with bitumen to make it watertight. That its origin is ancient we know, for it is often depicted on the Chaldean and Assyrian monuments, and the Babylonian record of the flood pictures Noah, "the father of the fleet," navigating a gigantic quffeh, 140 cubits in diameter—rather different from the orthodox Noah's Ark.

The Arabs are good swimmers, but in the centuries that are gone and to this day they use "water-wings." There is a tablet in the British Museum, dated 668 B.C., that might

have been a photograph taken to-day of Arabs swimming on inflated skins. The sheep skins that are used are taken from the animals in a most surprising manner, for the only holes that can be seen are the six where the neck, legs and tail have come through. The skins are roughly tanned and the holes firmly tied, one being left for the purpose of inflation by human means, the only method the Arab knows.

These inflated skins are also used for making rafts, 400 or 500 being needed to carry 50 tons of cargo that is floated down on them, a slow but very cheap method of transportation.

Little was to be seen of interest on that weary voyage until the Great Arch of Ctesiphon came in sight. This huge fragment of a great palace is one of the most imposing ruins in the world; the gigantic arch, all that remains of a vaulted hall, is one of the most stupendous creations of any age, it has no rival in the world, and, standing alone in the desert, it is a sight that is incomparably impressive.

In this great hall Chosroes held his Court 1,500 years ago, and the Arabs still sing of the loot they carried away when they sacked the place. It is said that this building was a copy of the great hall of Babylon built by Nebuchadnezzar.

Baghdad can be seen from afar on account of the flatness of the country. There is only a 100-foot rise in the journey from the sea. Most of us picture Baghdad as the glorious city of Haroun-al-Raschid, Aladdin, Sinbad the Sailor and all the other illustrious ones of the *Arabian Nights* that charmed our childhood. There is romance enough and to spare in the old city yet, but the squalor and sordidness make the wanderer think that the glamour rests largely in the poet's imagination. Below the surface, however, those who have the mind will find all the romance they wish, and there is colour too, colour that would make a painter's palette blush for shame.

The city that we now see is not the one of the days of the great Caliph; it is not even built on the same site. There is not a brick left standing of that famous round city. Time and the desert have obliterated those marvellous palaces and gardens, and the art and learning for which Baghdad was famous is only a memory.

A general view of the city can be seen from the top of the North Gate, the most conspicuous object being the beautiful blue-tiled dome of the Jami-el-Maidan, shining like a sapphire above the sombre buildings

that surround it. Away to the south there are houses upon houses separated by the narrowest of streets. Running through the city the muddy Tigris winds its circuitous way, while for a few miles beyond the city walls in either direction a fringe of date palms marks its course.

The Citadel, the Top Khanah, or "House of Guns," interests me greatly, for I lived there for two years. Outside the gatehouse there is a gun called the Top-al-Fatah, the "Cannon of Victory," that is of more than ordinary interest. It is a beautiful piece of bronze casting of Persian design, but the Baghdadi will have none of this. To him it is the form that an angel assumed when he helped the holy Sultan Murad to capture Baghdad.

For generations the Arabs have handed down the tradition of the heaven-sent cannon, and we used to see little ceremonies being performed in front of it. An Arab mother would take her baby son and pass him under the gun to a friend and receive him back again across the top, afterwards thrusting his head into the muzzle. Then she would tie a shred of cloth from the hem of her garment to the chain that fences in the cannon and place a row of candles along the barrel. Thus strength and bravery for the little one being assured.

Wandering through the streets the brilliant sunshine and colour of the Eastern scene enthral us; we never really see the sun in our own country. A Persian was once asked in London why his people worshipped the sun, and he replied, "If you ever saw him you would worship him too." The sunshine is all-absorbing and all-healing too; but for its purifying power disease would wipe out almost every Eastern city.

We enter the bazaar built of brick, with vaulted roofs, like narrow tunnels between the houses and other buildings; though they are narrow and ill-lit, on account of their comparative coolness they form the highway for almost all the traffic that passes through the city.

Hardly have we entered this bazaar when, above the din of bargaining and money changing, [we

hear the shouts of "Ba'lack," "get out of the way," as a drove of donkeys, laden with skins for a tannery, driven by a boy perched on top of one of the unsavoury bundles, comes trotting along. The crowd closes in behind them, but before the commotion subsides we hear the "clank-clank" of the camel bells as a caravan of those malodorous and disdainful animals comes swinging along, filling the narrow passage almost to the roof. We flatten ourselves against the wall, or jump into one of the shops which are mere depressions in the brickwork.

When our eyes are accustomed to the semi-darkness, we look around. A wood-turner catches our eye. He is working the simplest of lathes, revolving the wood with a bow and guiding the tool with his foot, doing work that would be the envy of many a turner equipped with a power lathe and more ambitious tools.

The shoemaker still sticks to hand-sewn methods, and specialises in the red shoes that every Baghdadi wears. "As I cobble with needle and thread,

I judge the world by the way they tread;

Heels worn thick and soles worn thin,

Toes turned out and toes turned in,
There's food for thought in a sandal skin."



Old Baghdad



The Arch of Ctesiphon

The barber is quite an important man, and performs his work openly, for he carries his tools with him, and will cut hair or shave a head in any odd corner.

To my mind the scribe is one of the most interesting fellows in the bazaar. He is the only man who is really educated. He can read and write any number of languages; he knows the secrets of many, their business transactions and their love affairs. He writes in a grand, eloquent style. A most ardent well-wisher sent me a letter written by such a scribe:

*"To the Captain Sahib,
Sir,*

I most humbly beg to state that I am asking God to keep you safe for ever, and to enable you to obtain the highest posts, and I spend my nights and days praying God to maintain the British Government, who will be victorious always. Now my family dwelleth in Suleimaniyeh, and I am wishful to proceed to the said district to interview them. I beseech you to grant me a few days leave. . . ."

At whatever time of the day we wander by a coffee shop we shall find it busy, with Arabs sitting contentedly on the hard benches with their shoes off and their feet tucked underneath them. We have walked far so let us join them. An Arab waterpipe is first brought by the waiter, who lights it with a piece of live charcoal held between long iron tongues, the charcoal remains in the pipe to keep the powdered tobacco alight. The ceremony of pipe lighting is a lengthy

job. There is no hurry in the East. "Leisure is of Allah but hurry of the devil" runs the Arab proverb. The compliments of the morning are passed to one's neighbours with the familiar "Salaam halakum," then conversation drifts on to the topics of the day. The Arab is not a noisy talker, but loves an argument, and his independent life gives him a mind of his own. Much wisdom is talked in the coffee shops, and news of the outside world can be gathered there long before it comes through the ordinary channels of telegraph and wireless. By the time the conversation is fairly under way the waiter is round with the coffee, the finest coffee in the world, served in most alluring pots. It is only taken in sips from the tiny cups as the hours roll by.

We have plenty of time to study our friends. The Arab and his camel have been the subject of many a song and story. He is a picturesque fellow, more picturesque in literature and art than in actual life perhaps, but his love of freedom which he prizes above all the comforts of civilisation appeals to every man.

The Arab owns the desert as the sailor owns the sea, he makes his way across the trackless plains with only the sun and stars as his guide. The desert is his glorious heritage and he will never exchange his independence for the safety of life in a town; he looks down upon the man who sleeps with a roof over his head, and I for one cannot blame him; to sleep in the desert under the stars is a sleep beyond compare.

The Kurd is a wild and fierce fellow, and lives by blood and

plunder, but his love of adventure, his swagger and good humour go a long way to cover up his many faults.

The Dervish is another type of man we see wandering among the Eastern bazaars from Kandahar to Baghdad. He is clothed in scanty white garments of dubious cleanliness, with a leopard skin as an extra protection from the cold. He makes a striking figure with his long unkempt hair and beard and bare chest, armed only with a rude club, his wits and a begging bowl. He is supposed to be a religious man, and his general appearance is in accordance with our accepted notions of what a holy man should look like.

Some are learned, and there are poets among their ranks, so the best seats in the coffee shops are given up to them, for they sing songs and tell stories. They are not averse to telling fortunes and giving charms or administering to the ills of the body, or prescribing love potions for the sick of the heart.

The Mullah, who is a priest, is bound to wander by. This is not the time nor place to go into the subject of the religion of the Arab, but it is not surprising that he believes in the Unity of God, for his world is one of unity—one sun, one sky, one horizon. The Arab spreads his carpet on the desert five times a day, and repeats the prayer—"Allah hu Akbar!" "God is Great!" It is the call of the man who lives in a large place.

We see many men but few women in the street, and those we do see are mostly Jewesses, who do not cover their faces quite so securely as their Arab sisters, who are black shadows as they walk abroad.

I wanted to photograph some Arab women in more attractive garb, and



Venice in Asia

mentioned it to Haji Abdulla, an Englishman who had lived in Arabia for fourteen years as an Arab. Strange man, who for some reason or another wished to absent himself from his countrymen, and after a certain amount of persuasion invited me to his house to meet his wives and their friends, with the result that I was able to make a few rather unusual studies. Their standards of beauty are different from ours, but they have a Cleopatra-like dignity that is very commanding and a barbaric love of jewellery. The outdoor dress is always black, but their indoor clothes are made of lavishly coloured silk or gaudy Manchester print, according to the wealth and position of the husband. All his money is expended on his principal wife, who knows well how to keep the house in order.

Babylon is 60 miles south-east of Baghdad, and there is nothing but desert between. The railway to Basra now passes through Babylon, where there is a station—an awful vandalism, but such is progress. As the traveller journeys across the level plains he becomes aware of an unevenness on the horizon, and he knows that he is approaching the ruins of Babylon, the city that was once the wonder of the world. "For Thou hast made of a city an heap; of a defended city a ruin," wrote Isaiah. Only shapeless heaps of rubbish are left to tell the extent of the city that may have been as large as modern London. Though not so populous as London, it still numbered its inhabitants by the million.

The walls that surround it, now a belt of mounds, were the greatest defensive works ever created by man; six chariots abreast could drive

around them high above the city. The traveller, with no uncertain emotion, enters the walls through a fringe of date palms; he may be treading on the ground where civilisation as we know it first had its birth, for we find the city mentioned in records that are now 5,000 years old.

City after city, through the centuries, has been built upon the site, but it reached the height of its splendour and magnificence in the time of Nebuchadnezzar. It is his city that the excavators are re-discovering as they dig into the mounds.

Nebuchadnezzar was not renowned for his display of modesty, and every brick that is unearthed bears his boastful "I am Nebuchadnezzar, King of Babylon," in cuneiform writing. If he were a boaster, even now the ruins of his work command our admiration, for with building material that may seem extremely mean when compared with that employed in the stupendous temples of Egypt, he raised a city the memory of whose glory will never fade. With only brick he constructed buildings so solid and vast, and ornamented them with such profusion of colour and design that they excited the wonder of the most famous travellers of antiquity, and to-day they stand plumb and square in spite of the ravages of time and the desert.

The Ishtar Gate, built to the Goddess of Love, is the best preserved of any of the buildings yet unearthed. The mystical beasts that adorn the walls in bold relief stand out sharp and clear in the desert sunlight, though the gorgeous enamel work has long since fallen from them. The walls are still as upright as on the

day they were built, more than twenty-five centuries ago, and the mortar is harder than the bricks it unites.

Near by the Ishtar Gate they found a basalt lion astride a fallen man, a colossal piece of roughly-hewn stone, and set it up in a conspicuous position within the walls. What it signifies no one knows, or ever will perhaps, for no inscription appears to tell its history. It may represent the conquest of Egypt by Babylon, though a more fanciful explanation is that it commemorates Daniel's adventure in the lions' den.

The hanging gardens seem to have caught the popular imagination, and their position can be traced—but that is all. It is little wonder that they loomed so large in the descriptions of contemporary writers. Babylon was a city of the plains, yet from the distance there appeared to be in the midst a mountain with trees waving on its summit. This was the "hanging gardens," a grove of trees that were ingeniously watered from below, growing on the top of a gigantic square tower.

This extraordinary structure was erected by Nebuchadnezzar to please the fancy of his wife, who came from the uplands of Persia and sorely missed the verdure-clad hills of her native land. No engineering feat seemed too big for this vain-glorious monarch to undertake. The Euphrates ran through the heart of the city and was crossed by a bridge that would cause our modern engineers some anxiety if called upon to construct it; but further it is said that there was a tunnel under the river that connected the two parts of the city. Is there anything new under the



The Baghdad Cobbler



The Scribe



An Arab Shoe Shop



Bedouin of the Jumail



Persian Kurd



Keeper of Daniel's Tomb at Kirkuk

sun? Looking at these walls one wonders what our reinforced concrete will be like in 3,000 years.

While wandering within the walls, the traveller finds himself in the theatre of Alexander—and what a wealth of romance is conjured up by that name, the most brilliant in all history. Alexander conquered all the then known world and wept for other worlds to conquer, yet he died in Babylon at the age of thirty-three, finding in death the only invincible foe he had ever encountered.

To the west is Nebuchadnezzar's palace, or all that remains of it—sufficient, however, to outline its great extent and trace the separate rooms. One can go through the doorway, the arch of which is still standing, that Daniel must have entered many a time when summoned to the presence of the mighty king. While standing in the banquet hall it needs little imagination to picture that great hall filled with revelling and drunken courtiers, with Belshazzar, the most drunken of them all, reclining on his throne in supposed security, while Cyrus the Persian was hammering at the very gates of the city. Suddenly he sees the writing on the wall, emblazoned in letters of fire: "*Mene, mene tekel, upharsin*"—words which none but Daniel can interpret.

Too late the warning came, and Cyrus, after two long years of unsuccessful siege against those impregnable walls, marched up the dry bed of the Euphrates, having diverted the water of the river into another channel—one of the most remarkable military achievements of all time. Proud Babylon was taken, the city sacked, and Belshazzar slain on the very steps of his throne.

"What is the good of all this rum-maging into antiquity?" some will say. We are inclined to think that civilisation is a tide that has been ever advancing from the beginning of time, but history tells us that we are wrong, for it is a tide that ebbs and flows. We may believe that from age to age it rises higher than before, and that with us the tide is at the flood, but I have my doubts; at least it is a fine world for those who are on the top of the wave. It is only by knowing the past, that we can appreciate the present, and look into the future.

To have contemplated a motor journey from Baghdad to the Caspian Sea and back would have been considered before the last war something in the nature of an adventure, and it was not without incident. Strange as it may seem, the whole journey of not less than 1,500 miles was done on a broken-down old Ford van, which thoroughly deserved its pet name, "Flying Bedstead," a vehicle that was in such a hopeless state of disintegration that a 20-mile journey might be regarded as no mean hazard.

We left Baghdad with its golden domes and minarets early one morning towards the middle of July, with only two cars, one of which was left behind later at Kirmanshah.

We made a fairly early start, though not as early as we had intended, for as every traveller knows, even if the kit does not include much more than the proverbial toothbrush and comb, it seems to take some time to collect. Certainly we allowed ourselves very little in the way of comforts, a blanket and a supply of films for the camera being the chief items regarded as necessary; a few tins of

"bully beef" were taken to help out the scanty provisions we were likely to pick up on the road. Water was carried in canvas bags that were almost waterproof, so that the surface evaporation would keep it cool.

The run across the desert to the foothills of Persia was very warm, with the thermometer at 120 degrees in the shade, in a land where there is no shade, but the pureness and dryness of the atmosphere makes even that heat bearable. The way was not very hard to find, for it was littered with the dried bones of camels and mules. This desert road has been a caravan route for centuries, and along this road the riches of the Far East were brought to adorn the palaces of Nebuchadnezzar in Babylon and Cleopatra in Alexandria.

The world's great conquerors have marched along it, sometimes coming from the east, sometimes from the west; it is a road that is "half as old as time." Yet the Arab caravans with a few camels still pass as they did when Abraham came out of Ur of the Chaldees. We welcome these ships of the desert with much the same feeling as ships at sea. They have wandered far; as most of their wandering has been in search of food and their meals have been few and far between, a race of lean and hungry-looking men and animals has been developed that can travel far and endure great hardship, obeying the rule of the desert, "thou shalt not boast of the distance thou hast travelled nor eat more than thy share."

We camped late in the afternoon and dined in the open. Shall we ever forget the glorious sunset we saw when the horizon faded away in pale amethyst, melting into tender blue;



Persian Dervish

golden ball sank out of sight me of the sky took on the hue nished copper and the desert l sprinkled with gold dust. The only lasts a few moments, but pageantry of half an hour in a emperate zone is crowded into glorious moments before the suddenly overtakes the day. all we ever forget the unspeak- auty of the desert night when rs hang like lamps in the sky. ere away early the next morn- Vell I remember the first sight Persian hills, how welcome they fter the sweating level plains, ey spoke of green grass and nd cool breezes. Khanaquin is t town in Irak. Here the desert e date palms and the scorching les ride end. -i-shirin is just over the border.

There is an interesting old castle there where lived a king who loved a princess with all the passion of his eastern heart, but she apparently was fonder of her bath than her lord, and would not marry him until an adequate water supply was laid on to the castle. Plumbing was not a strong point in those days, nor as a matter of fact is it to-day in Persia, but the king was not discouraged, and he had a great aqueduct constructed to carry water from a spring some miles away in the hills. The story might be true, for we found a section of the old water system.

It was not till we reached the Taq-i-Gireh Pass that our real troubles began. This was by no means a high pass, but the track was prodigiously steep and seemed to have been constructed for mules and mountain goats, not for Fords. Darius must have taken his chariots over it 2,500 years ago. We had to do a good deal of pushing up behind, but it was nice and cool on the top. The run along the Mahi-dasht plain was very charming, with high mountains on either hand. There is a little town called Karind built in a deep gorge at right angles to the main valley, on the banks of a stream which forms the main street and sewer as well; the town is cleaner than those that have no such advantage. The orchards and vineyards, with their apples and grapes, were a great delight after the dates and dust of Baghdad.

We had been going hard all day, and just as evening was approaching we came round the shoulder of a hill and caught our first glimpse of Kirmanshah, and to us it looked the most beautifully situated town we had ever seen. Great mountains rising to 11,500 feet overshadowed it,

fields of waving corn surrounded it, and green trees, orchards and gardens mingled with its houses. We had not seen anything really green for years, and to think there was some snow still on the mountains!

There is much that is picturesque in Kirmanshah, but picturesqueness and sanitation do not go together, and there was much filth and make-believe in this Persian city. We spent a few days in Kirmanshah. The bazaar is interesting even to one familiar with the miles of bazaar in Baghdad. There are fine mosques as well. No infidel is allowed inside under any consideration, but there was one mosque being repaired, and this seemed a chance of gaining entry through a hole in the wall. There were many strange things inside and the pictures on the wall made in coloured tiles were very unusual. One seemed to represent the Mohammedan idea of the Last Judgment; needless to say, photographs were taken with as little ostentation as possible.

Hammadan was our next objective. For 20 miles the road runs under the mountains, then turns suddenly north round the famous Rock of Bisutun. Here Darius, 2,500 years ago, had a carving made on the face of the rock, 100 feet or more above the road, representing the chiefs of the nations he had subdued paying homage to him. Around it are inscriptions in Persian, Susian and Babylonian languages, describing his wars and conquests. Sir Henry Rawlinson, after many years of labour, deciphered it and read Darius's autobiography. The Rock of Bisutun is the Rosetta Stone of



Woman in Zanarujan Tribal Dress



Sheikh of the Jabur Tribe



Sara, daughter of Malun, Chief of the Said branch of the Dhaifir Tribe



Kirmanshah

Persia, and is in a wonderful state of preservation after twenty-five centuries of exposure to the weather of the uplands of Persia. A journey to Persia to see this alone I should count as worth while.

The road runs through mountainous country, sometimes through broad valleys, and at other times over steep rocky passes. As we did not reach the foot of Asadabad Pass till late in the afternoon, we decided to camp for the night, and it was as well we did, for we should have found it very difficult in the dark.

The climb was a glorious experience, but a very trying one for the car was in bottom gear all the time, with the radiator boiling, and it needed a good deal of pushing up behind. There were hairpin bends and alarming twists and turns. The view from the summit was marvellous, the whole of Persia seemed spread out at our feet. The car ran down the other side of its own accord mile after mile, "one wheel on the wings of the morning, the other on the edge of the pit," all the way to Hamadan.

Hamadan is a much larger town than Kirmanshah, finely situated among the mountains, but none the less dirty for that. I don't think the Persians ever wash or change their clothes; they are said to put a new suit of clothes, if they ever have one, on top of the worn-out ones rather than take them off.

Behind the town there is a hill with the ruins of a castle where Darius lived during the summer. He is reported to have wintered in Babylon. There is also a stone lion, a relic of Alexander's great march, of which there is no parallel in all history.

The ride from Hamadan to Kazvin was pretty rough going, though we were now on the great Russian road that runs for 300 miles to the Caspian Sea. No doubt it was a wonderful engineering feat when it was made years before, but it looks as if nothing has been done to it since. Almost as soon as we started we were in trouble, for over one of the holes in the road we broke the front spring, but a couple of tyre levers and a piece of rope soon made a splice. Sometimes we ploughed through deep sand, and we found it better going on the rough country by the roadside.

We spent the night in a Khan at a place called Arveh almost on top of one of the passes, and in spite of the fact that we were under cover, we were glad to make a fire to keep ourselves warm. Fires in this part of the world are made from sun-dried camel dressing, which amongst other things gives out plenty of heat. A Persian Khan is a thing to be remembered if only for the multitude of its permanent and active inhabitants. As someone has said, "it is not their biting that worries us, but their walking about!" A series of rooms are built round a square courtyard. The rooms are entered from the courtyard. Some of them have windows, or rather holes to let in the light, but none of these windows face outwards. All that we can see from the outside are four square walls, and a doorway piercing one of them. The animals of the caravans are tethered in the square and their masters sojourn in the rooms, though some prefer to sleep with their beasts in the open.

Next day, after a rather restless night, we breakfasted off hard-boiled

eggs and flat slabs of a leathery substance that answers the part of bread in that part of the country washed down with tea from a var that is left on the boil night day. We made an early start, I had not gone far before we began to puncture badly, and soon a spare tube was used and then nothing for it but to stuff the car with our blankets. However, we reached Kazvin before nightfall.

The approach to that city is impressive, for on every road the brilliantly tiled gateway, looking fine and resplendent from a distance but ruinous and tumbling into ruin on closer inspection. Mosques abound; the Imam of Shah Husain Mosque is particularly fine though it is only just within the town it dominates the town. At the close of sunset the Mullah ascends the minaret calling the faithful to prayer. The great words "Allah hu Akbar" roll out in rich cadence as the flock into the mosque.

North of Kazvin there is the range of the Elburz, with the peak of Demavand rising to 18,000 feet; the road runs over the Barmak Pass; even though the scenery is very wild we had little trouble. It is a choice spot called Manjil, the wind blows an antarctic breeze 29 days in every month, we had to spend a night that night to utter the futility of insect powder, a certain period of the year natives give up their houses to intruders and live in the open. The scenery is grand, and making such remark to a Scotsman I thought, there, I received the reply, "have you ever seen the Grampians?"

Over the Elburz the scenery changes entirely. In the place of the great barren rocks we ran through wooded valleys and leafy lanes beyond Resht, jungle, damp and right to the shores of the Caspian that is only just salt enough to deserve the name of a sea. The last part of the journey was made in the dark with only a hurricane lantern light us through the cutting forest, and we knew that Kirmanshah, that romantic freebooter looking out for the likes of us.

Thus ended one of the most interesting journeys I have ever made. Much has changed since those days and now railways run where we slowly pushed our car. Perhaps of us who knew Persia in the old days may deplore the modernisation of ancient land. Through its long years of history it has fallen times and risen again, and to-day it is likely to play no unimportant part in the great happenings that may take place.



Wavell and Ironside discussing the Syrian Campaign
Courtesy Ministry of Information

James Jarché]

MY CAMERA AND THE WAR

By James Jarché, F.R.P.S.

A lecture on "My Camera and the War," illustrated by many lantern slides, was delivered by Mr. James Jarché, F.R.P.S., on Friday afternoon, October 10th, 1942, in the course of the Annual Session of The Royal Photographic Society, at 16, Prince's Gate, London, W. The President of the Society, Mr. D. McMaster, F.R.P.S., presided.

MR. JARCHÉ began by saying that he had been seeing—and photographing—some very important people, both at home and abroad, since the war began. He had been sent out to the Middle East, to Iraq and Syria, but he was not able to show all his pictures, for very obvious reasons. One that he would have liked to have shown was a picture of a new bomb. It took ten minutes to get a crane, working for an hour, to get it to stand upright for him to take its photograph.

Just before the war he was sent by the War Office to Gibraltar; he had with him a letter from General (Sir Ian) Hamilton, the Director of Public Relations to the War Office, and his task was to take photographs of the Governor, the future Lord Ironside. He gave an amusing account of his interview with that soldier, who was strongly averse to being photographed. At length he conceded, "Take a picture and then get out." Mr. Jarché was a long while fixing up his

camera, and presently suggested that the A.D.C. might pose with the General against a map of Gibraltar. Consent was grudgingly given, and then he had to go. But later he saw Lady Ironside, through whose great kindness he managed to get a number of photographs such as he wanted—the keys of Gibraltar on a cushion, the Governor's flags, the 2,000-year-old dragon tree, the Governor's horses, and so on. At the end he said, "Lady Ironside, you have saved my reputation. With these little pictures we can build up a feature for the journal for which I am working. But would it not be nice to have just one picture of you with the General?" She replied, "That is a good idea," and went to the telephone at once. "Edmund, come here." Mr. Jarché nearly collapsed, but "Edmund" came, and a first-class picture resulted, as well as an invitation to dinner that evening. As a consequence, after war had broken out, Mr. Jarché was the only photographer to get a

picture of General Ironside in his improvised bedroom at the War Office.

Mr. Jarché went on to say that he had lived with the "Ack-acks," the bombers, the fighters, the American commandos. At the beginning of the war he was sent off to a battleship for an unknown destination. He did not know even the name of the ship on arriving at the port, and had no idea where to go until his name was shouted from a little pinnacle. But it proved to be a grand ship, with a grand captain and a grand crew. Before it sailed he had a view of the great ships of the Fleet. Then one morning they were off, and presently they split up, and he found himself again at Gibraltar, with a new governor and the opportunity for new photographs. He came back with a convoy of thirty-seven little ships steaming at seven knots, and he was on a sloop. One night he dined with the captain and told him some of his experiences as a Press photographer.

"You are a remarkably lucky chap," said the captain, "to get to these places and see these people," and the next morning the captain told him to follow him, and took him to a part of the ship where nearly all the crew were assembled, and said to him, "Now, tell 'em what you told me last night." So he had to tell his story a second time, a bit embarrassing at first, but it went down well. At 3.10 in the morning the alarm went. What was supposed to be a German submarine had been spotted. Everybody stood ready, including the depth charge people, and of a sudden, right in front, "there came up the biggest whale one ever saw, spouting water!" The depth charge men got to work and it was blown to bits.

Mr. Jarché next described how he got a wonderful picture, which he showed to the audience, of four "Ack-ack" guns going off at once with 23ft. of flame. His ambition was to get all four guns in action at the same moment. Accordingly, he lived for three or four days with an "Ack-ack" crew near Bristol, where they were having occasional raids, but nothing happened, and he got "fed up" and phoned his office that he was returning next morning. They told him to stay another couple of nights, and on the last night the thing happened. Everything was in readiness beforehand; he knew exactly the points at which to put his tripod legs. He focussed twelve yards from the first gun, and then went off into nearly infinity, using a wide-angle lens, and at the word "Fuse" he had nothing to do but open his shutter and trust that the four guns would go off together. That night the alarm went at 1.30,

"and there was 'Jerry' right in the searchlight." He took his stand by the camera, wearing pyjamas, waterproof—for it was pouring with rain—and tin hat, and at the word "Fuse" he opened the shutter. Immediately there was the biggest crash he had ever heard, the windows went in, his camera was shot off the ground, hit him in the face and broke a tooth. Incidentally a wing was shot off the German plane. He could not imagine that he had got any picture with a terrific concussion like that, and later on he left for London, thanking the crew for a good time, and they responding. "Well, the four guns did go off, anyway." But that was not the end of his troubles, for on motoring back to London he was in a crash and found himself covered with blood. But he got to his office and handed in his films, and presently the boy came out with them from the developing room, and they showed the flame from each of the four guns. The exposure, of course, had been registered before the concussion happened, and the picture made a double-spread in *Illustrated*.

He then went on to speak of his visit to the Middle East. *Life*, of America, wanted a photographer to go there to represent them; they themselves, belonging to what was then a neutral country, were not allowed to send a photographer. Mr. Jarché accepted the job "on conditions." He went out in full uniform, badged, and with the words "Official Photographer" for all to see. He took three cameras, a Rolleiflex and two Leicas, and went off in a troopship. He was told when he left the War Office that there was nothing to worry about, and that the darkrooms would be able to process his miniature camera stuff. One thing that happened during that voyage was the development of a case of appendicitis. There were three Harley Street surgeons on board, but the trouble was that the lighting was so bad that they could not operate. Thereupon he suggested his Photofloods, and rigged up three of them in such a position in the cabin as to give an adequate and shadowless illumination for two hours. "While the operation was being done I stood by with my cameras well, they were my lights—and I got a grand series of pictures of an operation at sea." The man had fully recovered by the time they got to Suez.

In the Middle East he met Sir Archibald Wavell. Mr. Jarché explained to his audience that there were "opposition" photographers there. He himself wanted "exclusive" stuff, so it was of no use going with the official crowd. He persuaded Sir

Archibald Wavell to give him a quarter of an hour, and the General suggested that he photograph him on his morning ride at 6.30, and did so. The General appeared in a yellow sweater and cowboy chaps, and showed extraordinary prowess in riding the horse, and afterwards he had breakfast with the General. But when he handed in the films Public Relations said that he had no right to do that sort of thing without letting them know, and in consequence he had "a blot on his copy-book" which remained for some time. But presently he got some good stuff for the paper in Egypt and also helped the War Office, so that all was "pally" again. The pictures of Wavell were published all over America and in Great Britain. Wavell, he said, was a man who wanted to know about everything, what camera he used, how much it cost, why he took on this job, and so on.

In the desert campaign he "ate pounds of sand and swallowed hundreds of flies," but he found it was the older men like himself who could stick the conditions best. He was the only one who could move about in the afternoon when it was 130 in the shade. Up towards Tobruk it was "just too bad." "You had to race your food to your mouth before the flies got in with it." The trouble with the cameras could hardly be imagined. The Leica stood it the best. To load the Contax, when it meant taking the back off in a sandstorm, would not bear thinking about, whereas with

the Leica one undid the top part and slipped in the film and it was all fixed.

Among others whom he met and photographed in the Middle East were Sir Andrew Cunningham, Sir Arthur Longmore, General de Gaulle, Admiral Cunningham (with Peter Haddon broadcasting to England from Alexandria), General Auchinleck (whom he also showed with Wavell working out the Syrian campaign), and Mr. Eden during his visit to Egypt, with Sir John Dill and Sir Arthur Longmore reading dispatches newly arrived from the desert. One scoop was a picture taken at G.H.Q., Cairo, with Eden, Dill, Wavell and others just before the battle of Syria; no flashlight was allowed, and the photographer was permitted in only for a moment to take his picture.

His pictures in the desert were remarkable. One of them showed X-ray men at work on an Italian prisoner who had a broken leg. Mr. Jarché said that if he had his way he would send all the Italian prisoners back to Italy and let them do propaganda for us. They were as fit as fiddles, they got good food, each man had his bed and table, and could write home to his wife and put the letter in a handy pillar box. Very many of the Italian prisoners were not real soldiers at all; they were artists and musicians, as could be told by their hands. The desert baker made beautiful bread of a kind not obtained in England, even in peace time. Incidentally, Mr. Jarché got



In Cairo

Left to right : Wavell, de Gaulle, Catroux, Spiers, Longmore
Courtesy Ministry of Information

James Jarché



Lord and Lady Curzon
James Jarché
Courtesy "Illustrated"

ly picture in existence of the of the mosque which housed nb of the great Seleucis. He o take this kneeling down, ag the camera on the ground aking a long exposure. Some icent pictures were shown of ab Legion coming in on desert also of the "Aussies" entering th. Mr. Jarché's travels took Jericho and Tiberias. The with these places, he said, at they were so "overdone"; areth, for example, there were uthentic" carpenter's shops. ing back to this country he l an underground bomb store where in England"; also one 'planes that went to Cologne, ounded around it its crew and staff and load, and again a f the first 'plane coming back e o'clock in the morning from a 1 Germany. This was taken Contax, 1.5 lens, in 1/25th sec. ig on the aerodrome. What ill more interesting was to any the same crew into "In- ice" and listen to their story, ven better, to go with them to ast and hear their more inticcount of their adventures. He howed some American coms, the fittest men he had ever ll "tough guys." oncluded with some "at home" its. The first was an entirely d picture of the King looking ie barrels of a gun. The next ie Prime Minister. Mr. Jarché lown to the Premier's private ice, Chartwell Manor, Westerone Sunday afternoon, and to rprise Mr. Churchill himself l the door to his knock. Apparthere was no one else in the He was shown round various

rooms and the pond in the garden, and after the photographing was over he was offered one of the famous cigars and a whisky. Mr. Jarché also had "close-ups" of Mr. Herbert Morrison, with a quite engaging expression, Mr. Ernest Bevin, whistling to himself whilst waiting for some other photographers to get their "traps" ready, and Sir Stafford Cripps—"a grand chap and a grand picture"—just returned from Russia. "I like these unposed pictures of well-known men."

At the end of the lecture questions were invited. The President commented on the quality of the pictures and asked about the processing. Mr. Jarché said that the difficulty in the desert was that the weather was "so hot that you cannot muck about with your films." It was impossible to develop in daytime anywhere. To get a cold water bath in Cairo one had to turn on the cold water for at least one-and-a-half hours. He used to wait until three o'clock in the morning to do developing. When he got there he found that they had no idea concerning the processing of miniature films. But things had now greatly improved, and they had got down to tank development, thanks to Capt. Bacon, who was on the *Evening Standard*. The sand was the great difficulty. One had to blow on the film before it was put in the developer. If the lens of the camera was taken out and put back again without dusting things were apt to go very wrong. A powder finer than ladies' cosmetic powder settled everywhere even in Cairo.

Asked what film he used, he replied Kodak Pantomatic and Ilford F.P.2; the latter was the best film from his point of view. He had not used any colour film, he thought it too danger-



Wavell in "Cowboy Chaps"
James Jarché
Courtesy "Illustrated"

ous to try, because he was going to be away for months in the broiling sun of the Middle East and could not get it processed. In reply to a question as to whether he had any trouble concerning contrast, he said that he had to carry with him a piece of silver paper mounted on cardboard, and when they came to something which they wanted to photograph his driver would put it up and so he got the modulation that he wanted.

In answer to another question he said that he used flash no more than two or three times—there was no need, the light was so terrific. It might have been useful to have had a synchronised flash on occasion, but there was the trouble of transporting the batteries. As it was he had to carry the camera in an airtight case.

The President, in the name of the very large audience, thanked Mr. Jarché for a most entertaining lecture, and begged him to come again.

Mr. JARCHÉ responded by saying that he would be glad to accept the invitation. "I have such a lot to tell you that it is beginning to race me." He had, of course, many pictures which at present he was not permitted to show, but which he hoped would interest the public when circumstances were different from those now obtaining.

A Film Pioneer

The June, 1942, issue of the *Journal of the Society of Motion Picture Engineers* contains a tribute to Mr. Edwin S. Porter, whose name has been added to the honour roll of the Society. The article says "contemplation of the history of motion pictures reveals few more significant figures than Edwin S. Porter, and none about whom less is known or has been written. Yet he was a pioneer, a trail blazer who left an imperishable footprint on the film. . . . He invented the first portable projection machine out of which evolved a projector that is universally used to-day, the 'Simplex.' More, perhaps, than that, he was the first to tell a story on the screen." Previously prize fights, snatches of acrobatics, butterfly dances, etc., comprised all the screen apparently had to say, but Mr. Porter and his chief, James H. White, thought of something better and longer, the Life of an American Fireman, the then unprecedented length of 500 feet. In 1903 Porter produced a far more ambitious film of greater historical importance. It was called "The Great Train Robbery," and is now a treasured item in the archives of film libraries fortunate enough to own a print.



Doberman Pinscher

EXHIBITIONS AT PRINCE'S GATE

Photographic Alliance Competition Prints and Slides and
Dog Portraits by Mr. S. Mawhinney, F.R.P.S., of New York

DURING the present month, two very interesting Exhibitions are on view at Prince's Gate.

They are the 1942 Photographic Alliance Competition Prints and Slides, and a set of fifty Dog Portraits by Mr. Arthur S. Mawhinney, F.R.P.S., of New York.

At the close of the Exhibition, the Alliance Competition Prints and Slides will be available for circulation among the affiliated societies.

Both prints and slides are accompanied by critical commentaries, the prints by Mr. Bertram Cox, Hon. F.R.P.S., and the slides by Mr. G. E. W. Herbert.

It will be of interest to quote Mr. Cox's remarks on the prints from the Competition which are reproduced in this issue.

Writing of "JANUARY LANDSCAPE" (*Frontispiece*), by Mr. A. Barraclough, F.R.P.S., Huddersfield Camera Club, he observes:—

"This print is a perfect answer to those who blame a process for the sins of those who misuse it. It is safe to say that nothing has been lost here due to the process, and the probability is that something has been gained. That it is impossible to point out where a gain has been secured is due to the skill which has been employed. The composition is very satisfying, the lines sweeping in from the sides and compelling the attention to travel to the distance. The tonal values are very good, and there are none of those solid blacks which occur in so many snow scenes. The result is that there is a soft

ively. The point of view has been excellently chosen with regard to the spacing of the verticals, and no tendency for them to run to the top. This is a very well-illustrated addition to the many fine made in Durham."

ers of the affiliated societies forward to pleasurable and evenings with the 1942

Competition Prints and supplemented with the commentaries of Mr. Cox and Mr. G. E. W.

Portraits

is an exceptionally friendly here in the Exhibition room second floor, where Mr. Arthur Mawhinney's excellent dog portrait has been on view since the 1st of December. As it was able to give any preliminary of the Exhibition, it has been to keep it open until the 30th of the present month (January).

Exhibition comprises some portraits, and in the issue of *Camera* (Philadelphia) for July, Mr. Mawhinney, in an interview with Mrs. Barbara Green, told something of his experiences and methods with his

He had always been fond of dogs, but when he took to photography he began with seascapes and seascapes. But he had some exposures on his dog,

Mawhinney does all his dog work with a 35 mm. miniature camera equipped with a 90 mm. lens. He varies exposures at f/6.3 to 1/100 second. For lighting he relies exclusively on a single flash bulb.

about backgrounds, Mr. Mawhinney produced a flannel

"You know the stunt; you roll it so it won't get but the more mused it gets the better. Sometimes the dog is close to it, if I want a shadow, sometimes the light is closer. The nearer the light to the background, of course, the better. Pictures have been made with a background, and no two are

interesting speculation as to why it was harder to photograph a black dog than a white dog brought on, "No. On the contrary, black dogs are much harder, because you rub them down with chalk putting them into the ring. Makes it very difficult to get definition in the hair—even if the head you're after. By the way, all my dog studies are heads. Although I stay from seven feet away from my

subject, the head is all that interests me, as the most important characteristics are brought out in it."

Asked how he made his enlargements from 35 mm. negatives, Mr. Mawhinney declared, "Why, it's simple. First, I develop all my negatives in X-33. I dry them quickly and non-dustily with the aid of a small invention." This turned out to be a box slightly longer and wider than a roll of film, at the bottom of which is a silk filter. The warm air is furnished by an electric hair dryer, attached to the side of the box. The films dry in fifteen minutes.

"Then I'm ready to make prints," Mr. Mawhinney continued. "My method of working is very simple. One thing I consider essential is an exposure meter for the paper. I use an M.C.M."

The developer he uses for paper is D-52, and Mr. Mawhinney tones all his prints. He feels strongly that every picture should be toned, if only for a short time.

"Next," he says, "I wax the print and mount it."

As for retouching, "My retouching is hardly worth mentioning," he says. "I never chalk a print. I do a bit of dodging now and then, and, of course, a little spotting."

Mr. Mawhinney attributes his success to the fact that as a "photographic baby" he learned to use a spoon first, before going on to the knife and fork. "Every one should be limited for a year at least to the use of one camera, one lens, one light, one film, one developer, one paper, and one method of mounting. After that you can launch out, if you want to, with a solid foundation on which to build."

This is an Exhibition that will give pleasure to all lovers of dogs. Incidentally, the handsome fellow on the opposite page, Doberman Pinscher, is the life-long friend of Mr. Joseph M. Bing, F.R.P.S., of New York, Honorary Foreign Corresponding Member of the Council.



Shetland Sheep Dog

EXHIBITIONS AT



SUMMER GIRL

Photographic Alliance Print Competition

HUGH PARRISH, A.R.P.S.

PRINCE'S GATE



PORTRAIT

Photographic Alliance Print Competition

S. J. ROBINSON

EXHIBITIONS AT PRINCE'S GATE



ACROSS WEST END OF NAVE,
DURHAM CATHEDRAL

C. R. R. ROBSON, A.R.P.S.

Photographic Alliance Print Competition

AN INSTRUMENT FOR THE MEASUREMENT OF GRAININESS*

By W. Romer and E. W. H. Selwyn

A method is described of measuring graininess by its power of obscuring fine detail. An enlarged image of the material under examination is thrown upon a test-object comprising a series of sets of test-patterns of low contrast. The size of test-pattern at which half the test-patterns of a set are unrecognisable is found to be proportional to the statistical average irregular fluctuation of density from point to point of the grainy material. It is necessary to provide observers with standard samples with which to compare their readings, in order to eliminate differences of criterion between different observers. When this is done, the accuracy of measurements is about ± 5 per cent.

THE essential feature of graininess is that an area of uniformly exposed and developed photographic material displays an irregularity of density from point to point on its surface, and it is upon this irregularity of density that definitions and measurements of graininess have been directly based. Lowry (1) has suggested that the term "graininess" be reserved for the visual appearance thus conferred upon photographic materials, and "granularity" for the purely physical property associated with it. There is, however, a need also for a more general term embracing both graininess and granularity in the above senses, and in order to avoid manufacturing a word, it is suggested that "graininess" be used in this meaning as well as in the more restricted sense covering the visual appearance. There seems to be little likelihood of serious confusion.

The granularity can be conveniently defined in a quantitative fashion in the following way (2). The fluctuation of density observed in a microphotometer record of a uniformly exposed and developed grainy photographic material is described moderately well by a distribution function

$$P(D, dD) = \frac{1}{\sigma \sqrt{2\pi}} e^{-\frac{(D - D_0)^2}{2\sigma^2}} dD \quad (1)$$

where $P(D, dD)$ is the probability that the density recorded at any given point on the material lies between D and $D + dD$, D_0 being the mean density of the sample, σ the area of the scanning spot over which the density is measured, and G a constant peculiar to each sample measured. G is adopted as a measure of granularity. It has the dimensions of a density multiplied by a length, as may be seen by reference to the above equation, and is of the order of 10 when density is measured on the usual scale of logarithms to base 10, and lengths are measured in

microns (1/1000 mm.). Thus the most appropriate units for G are "density-microns."

This irregularity of density has an obscuring effect upon fine detail, which for some purposes is a more important phenomenon than the irregularity itself. In pictorial photography, for instance, the irregularity of density can be objectionable in skies or other large areas without much detail, but in photographs taken for technical purposes the fact that they appear grainy may be of no consequence whatever compared with the loss of detail which the irregularity causes.

It is not difficult to see how the obscuration comes about. Imagine that we have some detail in the form, for instance, of two rectangular patches, such as are shown by the heavy lines of Figure 1, of greater density than their surroundings. This is the test object used for tests on visual acuity by Cobb and Moss (3). We superimpose upon this a piece of uniformly exposed and developed but grainy film. If now, as a consequence of the granularity of this film, it should happen that the areas under the rectangles are less dense than the remainder, by the right amount, the detail would disappear. Other more complicated cases are also possible which would lead to disappearance of the detail. If the grainy film is moved about over the test-pattern, the pattern will sometimes be obscured and sometimes not, according to whether the density distribution takes up an obscuring configuration or not. Thus the obscuring power of the film is properly calculated as the probability that the test-pattern will be obscured.

If all possible configurations which obscure the detail were known, the probability of their occurrence could be calculated by dividing up the area around the detail into small squares of area a as shown in Figure 1 and calculating the probability from equation (1) that square 1 had the density D_1 called for by the particular con-

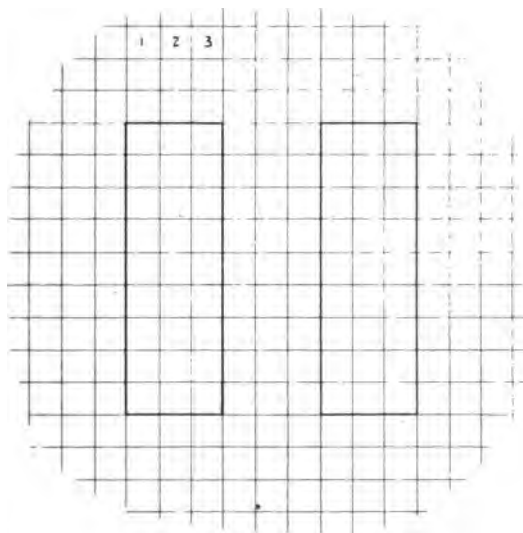


Figure 1. Detail and Scanning Spot

* Communication No. H890 from the Kodak Research Laboratories.

figuration under consideration, square 2, density D_2 and so on. The final result of the calculations, namely, the probability of occurrence of any of the obscuring configurations is the same as the probability that the detail will not be visible, and will be a function of G/\sqrt{a} , and the various densities of the elementary squares in all the various configurations. Suppose now that we have a

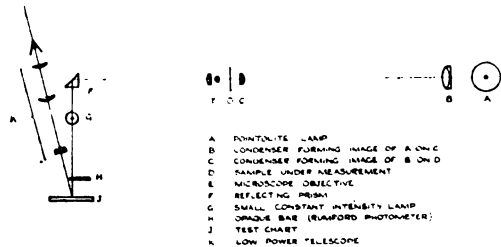


Figure 2. Apparatus A

series of test-patterns all similar in density, but of different sizes, upon which the uniformly exposed and developed film is placed, and each pattern is now examined by means of a microscope of which the power is adjusted so that all the patterns appear to be of the same size. The various configurations which will obscure the patterns will then be identical for each pattern, whatever its original size. They can therefore all be defined by the same function of D_1, D_2, \dots and G/\sqrt{a} . But the equivalent value of a on the original film will be less the greater the magnification; less, that is, the smaller the pattern. In fact, if A is the area of one of the rectangles of Figure 1, there will be a constant ratio between A and a . Thus in these circumstances the probability of obscuration of the test-pattern can be regarded as a function of G/\sqrt{A} . In practice it is not necessary, at least for a limited range, to keep the apparent size of the test-patterns always constant, provided that the magnification is such as to give optimum visibility of the test-patterns in the middle of the range. The eye and brain seem to allow for the change in scale, by paying less attention to fine detail in large patterns and more in small patterns. If, therefore, the size of pattern could be found at which the probability of obscuration was, say, 0.5, there would be a fixed ratio between G and \sqrt{A} . In other words, the linear dimensions of the test-pattern would be proportional to granularity. This forms the basis of the method of measuring graininess now described. The argument so far has been restricted, by implication, to test-patterns of the shape shown in Figure 1, and the apparatus which has been constructed also uses test-patterns of this shape. The same argument applies of course, to test-patterns of any shape, provided that it is realised that the obscuring configurations for one shape of test-pattern are not the same as for any other shape. In the particular case when the test-pattern consists of very long parallel lines, \sqrt{A} must be substituted by the distance between adjacent lines or an equivalent linear dimension. Formally, we might take care of these points by using instead of \sqrt{A} the expression \sqrt{fA} , where f is a "shape-factor," which in the case of long parallel lines, for instance, is such that \sqrt{fA} is equal to their separation. In this connection it may prove important whether there is any symmetrical or periodic repetition of the test-patterns. The visibility of a single line, for instance, is almost certain to be different from that of a set of similar lines spaced out in regular order. If the test-patterns are all the same size, but of different

density, it is found that it requires a greater degree of granularity to obscure the patterns of higher density, but tests on this possible method have not led to quite such satisfactory results as that depending on the variation in size, because the relation between granularity and density of test-pattern is not linear.

Forms of Apparatus

Two forms of apparatus were constructed, both of which work on the same principle.

In the first type of apparatus (A), which is represented diagrammatically in Figure 2, an image of the test-sample is thrown at a magnification of 24 on to a test chart printed on paper. The image is then viewed by means of a low-power telescope, or simply with the naked eye if the test-chart pattern being observed is large. The brightness of the image is adjusted to a fixed level by comparison with the brightness produced by a test lamp, the comparison being made by means of an opaque bar used as in Rumford's photometer. The test-chart patterns are shown in Figure 4. In the test-chart itself all the patterns are arranged along a line, and not in three sections as in the illustration.

In the second type of apparatus (B), shown in Figure 3, the enlarged image of the test-sample is thrown into the eyepiece of a microscope. At the focal plane of the eyepiece is placed a transparent test-chart of patterns similar to that shown in Figure 4, but on a smaller scale. The enlarged image and the test-chart are observed together by means of the eyepiece. A comparison field for adjusting the brightness to a constant value is provided at the edge of the field by means of a prism with one lenticular face which throws an image of an illuminated stop into the exit pupil. This image is of the same size and identical in position with the Ramsden disc.

Apparatus A is easier to use in many respects than apparatus B. In apparatus B, the test-chart and image of the test-sample must be adjusted to be without parallax, but in apparatus A this happens automatically, and the only requirement is to focus the image of the test-sample as sharply as possible on to the test-chart. Also the eye is used either alone or with a low-power telescope with such a large exit pupil that one is barely

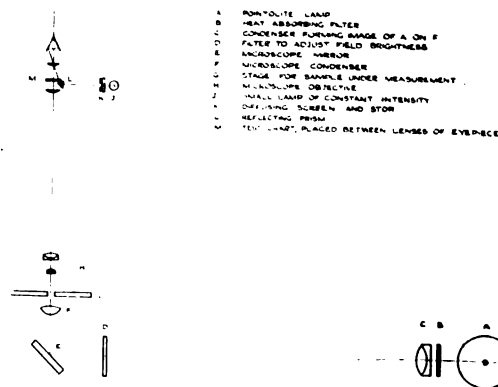


Figure 3. Apparatus B

conscious of it. Against this must be set the fact that the possible brightness is low and that the apparatus must be used in the dark. The maximum density to which readings can be extended is about 1.5. The second form of apparatus can be used in a light room, and gives readings to densities as high as 3.0. It is, therefore, preferable for general use.

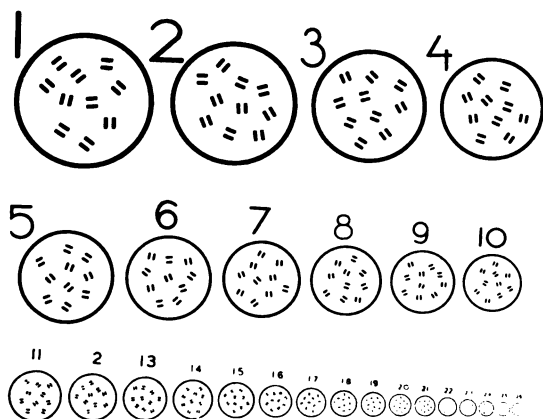


Figure 4. Test Charts

Method of Making Observations

When the apparatus has been focused correctly, the observer proceeds to estimate the number of individual patterns which are regarded as resolved in each circle of the test-chart, each circle of which contains ten individual patterns. The condition for resolution is that the two dark bars shall be recognisably separate, and recognisable in direction. The individual patterns in each circle are distributed more or less at random, and differently in each circle, with the object of preventing the observer from remembering the arrangement and thereby obtaining misleading results. A curve is plotted between the number of individual patterns resolved and the number marked for each circle. This is equivalent to plotting against the logarithm of the size of the test-chart, since each set of patterns is 1.1 times the linear size of the following pattern. The size of pattern at which half the patterns are resolved is then read from the curve.

Since the probability of obscuration is a function of G/\sqrt{A} , it follows that if the number of test-objects obscured is plotted against the logarithm of A , a curve of the same shape will always be obtained, the curve being displaced along the log. A axis according to the value of G . This latter point is illustrated by Figure 5, which

shows four sets of observations, and a mean curve through them. Each set represented by a particular symbol is the mean of a great number of observations corresponding to different graininesses, in which the readings have been moved along the log. A axis until the 50 per cent mark coincided with a given mark on the log. A axis. All the readings were then averaged at given points on the log. A axis. The four different symbols refer to two observers using both apparatus A and apparatus B.

Relation Between Granularity and Size of Test-Pattern Obscured

The size of test-pattern which was 50 per cent obscured was measured when using the six samples of developed photographic plate, of which the granularities have already been measured as described previously (2). In those measurements it was found that the G of equation (1) was not truly a constant. Consequently, the choice of a value of G with which to compare the 50 per cent obscuration size is somewhat arbitrary. The value chosen is the G_0 -value, which is the value of G found for very small values of a . The value of \sqrt{A} of the test-pattern which was 50 per cent obscured was then divided into the value of G_0 . This quotient is expected, on the assumption that G_0 is the appropriate measure of G , to be constant for any given density of test-pattern and for any given observer, as explained above. It will be observed from Table I that this is approximately so. The standard deviation from the mean for any one observer and test-pattern density is, in general, about 8 per cent. The final column showing the average percentage difference of the individual values for each sample from the value shown at the bottom of each column, suggests that the values of G_0 are themselves subject to errors of quite appreciable amounts. If allowance is made for this, it can be reckoned that G_0 and \sqrt{A} are proportional to within about ± 5 per cent. Observers do show systematic variations, but these can be largely eliminated by the method of comparison with standards, as described later. It should also be remembered that the above observations are subject to any variations of criterion of resolution from which an observer may suffer during the course of the observations.

The granularity depends upon the grain-size and the density of the sample. Thus, for instance, sample B. (2) has grains of smaller size than C. (1), but since B. (2) has the higher density, the granularity of B. (2) is, very

Table I
VALUES OF G_0/\sqrt{A} . (A MEASURED IN μ^2)

Sample	Aver. Grain Size μ	Den'y	G_0 Den'y Mic's	Method A						Method B				Aver. Per-cent. Diff. from Mean
				Observer A		Observer B		Observer C		Ob. A	Observer D		Ob. B	
				Test-pattern Density		Test-pattern Density		Test-pattern Density		T. pat. Den'y	Test-pattern Density		T. pat. Den'y	
				0.15	0.30	0.15	0.30	0.15	0.30	0.3	0.16	0.21	0.16	
A. (1)	0.83	0.37	0.45	.0286	.0635	.0317		.0425		.0855	.0550		.0475	+0.4
A. (2)	0.79	1.33	0.78	.0258	.0681	.0305	.0660	.0338	.0918	.0979	.0425	.0866	.0475	-5.1
B. (1)	1.41	0.33	0.92	.0304	.0713	.0359	.0832	.0405	.0982	.0850	.0557	.0820	.0422	+3.6
B. (2)	1.30	0.75	1.40	.0263	.0632	.0324	.0789	.0453	.0817	.0935	.0538	.1050	.0537	+3.6
C. (1)	2.20	0.37	1.35	.0291	.0566	.0291	.0730	.0374	.0832	.0878	.0504	.0856	.0469	-5.2
C. (2)	2.15	1.20	2.34	.0278	.0624	.0278	.0714	.0373	.0983	.0929	.0655	.1142		+2.8
Mean Standard Deviation				.0281 0021	.0642 0046	.0312 0025	.0742 0059	.0395 0036	.0907 0070	.0905 0050	.0538 0068	.0955 0131	.0480 0081	

nearly, equal to that of C. (1), and, similarly, the granularity of A. (2) approximates to that of B. (1). But in both cases, there is no systematic difference in the obscuring power, and it is a fair conclusion, therefore, that the obscuring power does, in fact, depend only upon the granularity.

It must be pointed out that the answer obtained for the size of pattern obscured depends to some extent upon the precise form of apparatus used. For instance, it has been decided that for regular measurements, the same objective of numerical aperture 0.3 shall be used as was used for the original measurements, together with a condenser of the same aperture. For, as was then pointed out, there is strong evidence that the granularity depends very much upon whether the light used for observation is specular or diffuse. Measurements made with objectives and condensers of different aperture bear this out, as is shown by Table II.

Table II
EFFECT OF APERTURE

Aperture of Objective (N.A.) ...	0.45	0.30	0.17
Condenser Aperture (N.A.) ...	0.30	0.30	0.17
\sqrt{A} (for given sample)	0.016	0.020	0.024

The increase of \sqrt{A} as the numerical aperture diminishes is attributed to the lesser granularity in diffused light, than in specular light.

The observed values of size of the test-object which is 50 per cent obscured show some systematic deviation from proportionality to the density of the test-patterns. Thus, observations of obscuration of test-patterns of different contrasts are not so convenient as observations on test-patterns of different size for the measurement of granularity. At very low densities of sample, in particular, measurements of granularity cannot properly be made. For then test-objects of moderate or high density are comparable in size with the individual grains of the emulsion. The scanning spot of the theoretical calculations is therefore of the same order of size as the grains themselves, and the density fluctuates between zero in the spaces between grains and a limiting value fixed by the flare in the optical system. Such a variation of density between more or less fixed densities has less obscuring power than the very irregular variation obtained with samples of higher density, to which the Gaussian formula applies more exactly. If the test-object is small enough, the number visible is determined only by the ratio of clear to opaque space in the emulsion layer, and the limit of size is finally determined not by the granularity but by the acuity of the eye.

The influence of these departures from the original suppositions is diminished in practice by referring the measurements to standards, and by using always the same apparatus, and test-objects having densities within 0.1-0.4. The standards consist of small specimens of developed photographic plates upon which have been cemented cover glasses for protection against scratching. Checking the readings against these standards, not only reduces the above troubles, but also reduces variations from observer to observer, or, indeed, variations from time to time for one observer.

An examination of numerous measurements of granularity of negative materials suggests that measurements made by this method of comparison against a standard are usually within ± 5 per cent, and only rarely as much as ± 10 per cent out.

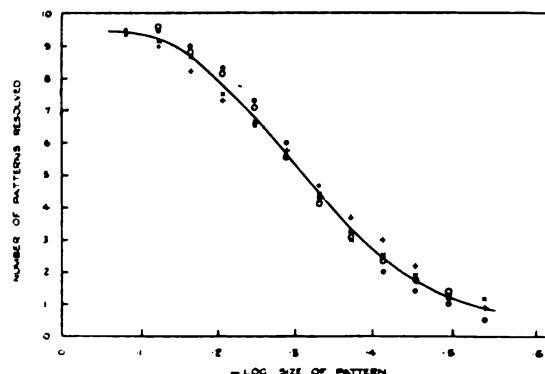


Figure 5. Obscuration and size of pattern

Since in technical applications it is usually the obscuring power of graininess which is more important than the fluctuations of density, as such, it is possible that a re-definition of graininess on the basis of its obscuring power is desirable. According to the experiments described here, there is little real difference between measurements made on that basis, and those by statistical analysis of density fluctuations. Such re-definition is not, therefore, a matter of any great practical importance.

We wish to record our thanks for help by various members of the Kodak Research Laboratories, in particular by Mr. A. L. Shuffrey, who assisted in the observations and constructed apparatus B.

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- (2) Selwyn, E. W. H., *Phot. J.*, **75**, p. 571, 1935; *Phot. J.*, **79**, p. 513 1939.
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Curves

A. E. Gnaegi, A.R.P.S.
Pictorial Group Members' Exhibition

VO METHODS OF MAKING COLOUR PRINTS

A joint meeting of the Colour and the Miniature Camera Groups of The Royal Photographic Society was held on Friday, July 10th, 1942, at 16, Prince's Gate, S.W.7, with Mr. F. J. Tritton, B.Sc., F.R.P.S., in the Chair.

Colonel W. Symon read a paper on "Colour Prints from 35 mm. Transparencies," and accompanied it by an exhibition of some apparatus and a display of prints and slides.

Mr. J. R. Jeffress followed with a short paper on "Colour Prints with the Carbro Process from Dufaycolor Transparencies."

COLOUR PRINTS FROM MINIATURE TRANSPARENCIES

By Col. W. Symon, C.M.G., A.R.P.S.

I HAVE been asked to put before you to-day the methods I employ in making colour prints from mm. transparencies. I would like to state that up to making of the actual Wash-off Reliefs all the work is done with miniature apparatus and materials.

Some time past I have been experimenting with a method, if possible, of simplifying and standardising a method of work by which, shall I say, passable colour can be obtained from good Kodachrome and Agfa-transparencies, with as small a percentage as possible of complete failures.

I appreciate the fact that for the best reproduction of colour is necessary for the making of the Wash-off Reliefs, but as I am limiting myself to 35 mm. slides up to and including the making of the separation negatives, this ideal has had to be sacrificed.

I begin with I will briefly give the layout of the apparatus used.

A Focomat Model 1 is employed; I shall have time to say about the lamp later on. To hold the transparencies a metal mask for 4 cm. x 4 cm. negatives is obtained, and the opening enlarged to take the 2 in. x 2 in. slide.

An adapting ring, "M" 1:1 is screwed into the enlarger and a 5 cm. Elmar lens is screwed into the adapting

5 cm. Elmar lens was employed instead of the one as I have mounted the three special Sharp Cut Filters No. 29 (Red), No. 61 (Green) and No. 49 in Leica wide-angle lens hoods to facilitate changing filters and also to exclude extraneous light entering the camera body during exposure. A cardboard tube is placed on the rotating stage plate to assist in the control of light.

The Focomat rotating stage plate on its special stand and with the angular magnifier is placed below the enlarger, which is set at 6½ magnifications. As will be the stage plate is reversed so that the camera and filter are below the plate. Two clamps hold the plate steady firmly in position. If the top surface of the plate is 11.125 ins. above the base board, this will give 1:1 projection, fine focusing being carried out by the lamp house and the lens extension collar.

The shutter is set for bulb and an extension release is

Essentially accurate exposures are essential, a mechanical timer is used. (T. Baeuerle & Soehne's Type B.S.

obtaining the average or integrated density of the transparency, and later on for comparing the separation

negatives, a Watson-Symon Enlarging Calculator is employed. I may mention that one of these instruments is available at The Royal Photographic Society for the use of members.

Now to get on with the subject of the processing: there are three separate stages of the work to be carried out before one can arrive at the finished print:—

- (a) The making of the set of separation negatives, and on this depends the success or otherwise of the finished print.
- (b) Exposing and processing the set of Wash-off Relief positives.
- (c) Making the print from the Wash-off Relief positives.

To obtain a satisfactory set of negatives one has to consider:—

- (a) The light
- (b) A suitable film.
- (c) The correct filter factors.
- (d) Correct exposure.
- (e) A developer to give the type of negative required.

With regard to the light, Kodachrome and Agfa Transparencies are at their best when viewed by projection. The colour temperature of the ordinary projection lamp is about 3,200°K. The ordinary 75-watt Opal Argenta lamp as used in the Focomat enlarger has a colour temperature of between 2,750°K. and 2,800°K. A 200-volt Argenta lamp run at 230 volts has a colour temperature of 3,100°K. This is better, but if a disc of Wratten Photometric Filter CC.3 can be obtained and be placed over the condenser in the enlarger, one would get a light of 3,300°K. illuminating the slide. I have been using, in the past, a Neron 230-volt lamp with a colour temperature of 3,025°K., but for future use I shall put a CC.3 filter over the condenser, bringing the colour temperature with this lamp up to 3,275°K. This will reduce the tendency of the print to be yellowish when compared with the projected slide.

When starting these experiments my first aim was to get, as nearly as possible, a matched set of four negatives of a step wedge, i.e., one without a filter and one with each of the filters already mentioned. Nos. 29, 61 and 49.

Two matched miniature Kodak step wedges were staggered and mounted as a slide, giving me a step wedge of twenty steps with densities of from .13 to 2.92.

Various types of film were tested, with a view to obtaining the most suitable type of negative as regards gradation and density; various filter factors were tried for each of the filters, to suit the film and the light, and finally various developers.

The usual practice is to develop the Blue Filter negative from 25% to 50% longer time so as to increase the contrast. As this was impossible, owing to the whole strip of film being developed together, the Blue Filter factor was increased to a point where, with the negative material and developer finally selected, a Blue Filter negative was obtained giving an integrated reading similar to that of the Red and Green Filter negatives, and showing visually under a magnifier the same number of steps.

Having settled the film, the filter factors and the developer, the next experiment was the making of a series of sets of four negatives of the step wedge: (a) no filter; (b) Red Filter; (c) Green Filter; (d) Blue Filter, with a basic exposure for (a) of 0.4, 0.6, 0.8, 1.0 and 1.2 seconds at $f/12.5$, and corresponding exposures for (b), (c) and (d), with the appropriate filter factors. This showed that the balance for each set remained constant, although the densities of the sets increased with the increased exposure.

To summarise the above:—

Light recommended: Mains at 230 volts, either 200 volt Argenta with CC.3 filter, or 230 volt Neron with CC.3 filter placed over the condenser. Film: Kodak Plus "X". Filter factors:—

Lamp	Filter	No. 29	No. 61	No. 49
200 v. Argenta ...	CC.3	× 6	× 9	× 40
230 v. Neron ...	CC.3	× 6	× 9	× 40
230 v. Argenta ...	CC.4	× 6	× 9	× 40
200 v. Neron ...	None	× 5	× 9	× 55

To obtain the basic exposure for the no-filter negative the meter reading of the transparency is obtained with the Watson-Symon Calculator.

The following fractions will give the basic exposure in seconds when the film is developed in Meritol-Metol variation of D.K. 20 for 10 minutes at 70°F.

200 v. Argenta or 230 v. Neron with CC.3 filter:

Argenta	27	34
MR.	MR.	MR.

230 v. Argenta with CC.4 filter

MR.

200 v. Neron no filter

MR.

The red, green and blue filter negatives being exposed for the basic exposure multiplied by the respective filter factors.

Basic Exp.	F.P.2	Filter	Factors
	Red	Green	Blue
	No. 29	No. 61	No. 49
40			
— C.T. 3025°K.	4½	10½	45
MR.			
40			
— C.T. 3300°K.	4½	10	40
MR.			

Meritol-Metol Developer. Modification of D.K.20

Distilled water (at 125°F.)	...	750 CC.
Sodium sulphite (anhydrous)	...	90 grams
Meritol	...	13.7 grams
Metol	...	2.3 grams
Kodalk	...	2 grams
Potassium thiocyanide	...	1 gram
Potassium bromide	...	.5 gram
Distilled water to make	...	1000 CC.

Replenisher

Distilled water (at 125°F.)	...	300 CC.
Sodium sulphite (anhydrous)	...	35 grams
Meritol	...	8 grams
Metol	...	1.4 grams
Kodalk	...	8 grams
Potassium thiocyanate	...	2 grams
Potassium bromide	...	.5 gram
Distilled water to make	...	400 CC.

20 CC. of replenisher to be added to the amount of working solution prior to the development of each fresh film. Total bulk of developer to be kept at 1000 CC., being filtered back into the bottle after use and the bottle being kept full.

Development time for Plus "X" Film, 10 minutes at 70°F. No extra time for subsequent films if the replenisher is added as directed. This developer will keep in a full bottle for a year, and will develop 15 films without showing deterioration.

For temperatures below 70°F., increase development time half-a-minute per 2°F.

For each set of separation negatives to be made, it is recommended that a set of separation negatives of the step wedge be made at the same time, giving identical exposures. If, however, several transparencies give the same or practically the same meter reading when tested, it will not be necessary to repeat the wedge negatives for each transparency.

After the film has been processed and dried, it is cut up into sets of four, and the meter reading of each frame is taken and noted. This information is used for determining the exposures for the Wash-off Reliefs.

I would mention that transparencies from which separation negatives are to be made are placed in the enlarger with the emulsion side facing the source of light.

Exposing and Processing the Wash-off Relief Films

There is very little latitude in exposure, if a satisfactory set of reliefs is to be obtained. The speed of the English Wash-off Relief seems to be slightly higher than that of the American-made film.

Using a 75 watt Argenta lamp of the correct voltage for the mains, I would say the speed is about that of either Kodak White Royal Soft or Ilford Natural Grain Normal. Personally, I work with the Calculator and rate the speed of the Wash-off Relief film at 2.

If the red, green and blue filter negatives of the wedge give the same meter readings or within 2, then the exposures for all three reliefs are identical.

If by chance, possibly owing to the variation of the mains, the filter factors are slightly out, and the red, green and blue wedge negatives give readings, say, of 40, 34 and 30, I calculate the exposure for the green filter negative gives 34/40 of this for the red filter negative, and 34/30 for the blue filter negative.

The processing of the reliefs is very fully described in the pamphlet "Colour Printing with Wash-off Relief Film," issued by Kodak, Ltd.

Personally, I start by attaching an X-ray clip to the film as it is taken out of the box, so that the film is never touched by hand until it is hung up to dry.

Each film is developed separately in a dish for five minutes at 70°F. in D.K.50, 6 ozs. of developer being used for each film in an 11 in. by 9 in. dish. As each film is developed it is transferred to one of the trays of a cascade washer, starting with the top tray. When all three reliefs of a set have been developed, the relief from the top tray is placed in 6 ozs. of bleaching solution R-10a, while each of the other films still being washed is moved up a tray. When the first film is bleached it is placed at the bottom

tray of the washer. This sequence is repeated till all three reliefs are bleached, when the white light is turned on.

For the hot water development the simple method of washing under a rose nozzle is preferred. With the film held in the middle of the short side by an X-ray clip and laid on an inclined sheet of glass, emulsion side up, the treatment is rapid and complete. Care must be taken to get the water running at 125°F. before starting the washing.

As each film is hot-water developed, it is placed in the acid hardening fixing bath F.54a for between one and two minutes, and then transferred to the lowest tray of the washer, being moved up as the other two reliefs are developed and fixed. After eight minutes washing the reliefs are placed for five minutes in 1% solution of formalin made up with distilled water and then hung up to dry.

Personally, I omit the clearing in permanganate reducer formula R-2.

Dyeing and Printing

This is very fully described in the Kodak pamphlet, so I will only mention a few variations which have been found convenient.

I have given up superimposing in register the dyed and rinsed reliefs while still wet upon the bottom of a white porcelain dish, as in my opinion the result varies from the eventual print. I prefer making a trial print, using as standard dyes with the following amounts of 5% acid per 500 CC. of dye solution.

Cyan	A Dye	...	3 CC.
Magenta	B Dye	...	5 CC.
Yellow	C Dye	...	10 CC.

From this trial print, the amount of acid for each dye estimated to suit the subject is settled and another print is made.

For transparencies which have no heavy shadows or for portraits, instead of using the plain C dye, I use a mixture of C and CK dyes, in the proportion of 500 CC. of C to 250 CC. of CK, with 1 CC. of 5% acid per 500 CC. of mixed dye. This mixed dye transfers much more readily than the plain CK, and like that dye must be put down first, followed by the magenta and cyan.

I have at times built up certain colours by putting them down twice and using dyes rather of low acid content.

Heating the top glass in hot water assists transfer, particularly in cold weather.

Discussion

After the reading of the paper, THE CHAIRMAN commented upon the successful results shown by Col. Symon,

and on the known difficulty of getting a good colour print from a transparency.

MR. JARROLD said that there were two questions he desired to ask. The first was whether Col. Symon had found the Agfacolor, with its much less contrast, easier to work, and the second question was whether, when getting Kodachromes or Agfacolor, instead of making an exposure to a continuous spectrum of white light, he had tried making three separate exposures through filters one after the other on the same colour film. For certain purposes he thought it would be found that there was less degradation if instead of using an imitation of daylight three separate exposures were made through narrow cutting filters such as Nos. 29, 61 and 49.

COL. SYMON said that he was rather afraid that he might get a certain amount of shaking in the enlarger from the mere fact of changing filters. The amount of time to be assigned for each of the different filters would have to be arranged.

In a further reference to his timing apparatus, Col. Symon said that it was a very useful mechanism, with two ranges, from two-tenths of a second up to six seconds, and from two seconds up to sixty. It was the sort of thing he would like to see produced in this country.

MR. JACK COOTE expressed surprise that in spite of all his careful work Col. Symon had never decided to construct a densitometer of some kind. He could not see how he could be getting useful information from his integrated readings.

COL. SYMON said that he had thought of trying to make a densitometer using either the meter he commonly employed or a Weston Master meter, and masking all off except an $\frac{1}{16}$ in. circle, using a strong light to one side and reflecting it up into the meter with a mirror so as not to heat the film or the cell excessively. He thought that could be done by using a motor-car head-lamp bulb. In reply to another question, he said that he did not use a wedge at all in his picture when he took it out of doors. He only took the transparency out of doors.

In reply to THE CHAIRMAN, he said that he had concentrated entirely on working from transparencies. In the case of still life subjects, three separate exposures could be made, but still life did not really interest him very much. He was sure that better colours were obtainable with direct separation negatives, using the proper film and filters, but with focal-plane shutters it was a little difficult to get the exposures right. He thought that accuracy in exposure was more likely to be ensured by adjusting the aperture of the lens and keeping the shutter speed the same.

COLOUR PRINTS WITH THE CARBRO PROCESS FROM DUFAYCOLOR TRANSPARENCIES

By J. R. Jeffress

MR. COOTE has asked me to give a description of my methods of making colour prints from Dufay transparencies. I should like to state at the beginning that I do not consider this method the best way to make colour prints, and that I am a great believer in One-Shot Cameras, wherever it is possible to use them. However, these instruments are somewhat cumbersome, and about four times slower than Daylight Dufay material, and there are times when it is necessary to make a Dufay or miss the picture entirely.

I normally make my separation negatives by contact, in an ordinary printing frame. A grey scale is always included; this consists of a wedge printed on cut film, on which is superimposed a piece of Dufay film from the same batch, with the emulsion removed.

I use the light from my vertical enlarger. The lamp

house is raised to the top of the column, and the lens at full aperture. I take great care to see that no white light is escaping from the lamp house. I have always used Ilford sharp cutting filters, red No. 205, green No. 408, blue No. 306.

I have found the exposure times, using Ilford Trichrome plates for the red and green, and a Selochrome for the blue to be as follows:—

Red	18 secs.
Green	20 secs.
Blue	1 min. 40 secs., developing the blue 50% longer.

Two points I have omitted. I place a piece of ground glass in the negative carrier of the enlarger, and I always expose through the back of the Dufay, not so much to

diffuse the grain, but to avoid Newton rings. The above exposure times vary a bit from batch to batch of plates.

The negatives are developed altogether in I.D.2, and then dried in a warm cupboard, care being taken to see that they all stand the same way up, so as to avoid uneven drying, with consequent colour wedging.

I am fortunate enough to possess an Autotype photo-electric densitometer, and the grey scale is carefully read on this, before proceeding with the making of the bromides for Carbro.

I have never been really satisfied with the results I have obtained: there is always a loss of colour, and the prints have a harshness about them which is somehow unphotographic. If the negatives are developed to a lower contrast the colours suffer badly. Owing to these defects, I had practically given up making prints from Dufay until a friend suggested that I should try masking. I have not seriously attempted this yet, but hope to do so this winter. A very low contrast positive is made on an Ilford slow ordinary plate, and developed by inspection in a very diluted I.D.3. The mask is then clipped in register with all three plates, when the bromide enlargements are made. It helps to reduce the contrast and also improves the blues and greens, although I have not sufficient knowledge to be able to explain why.

Recently, in making separation negatives, I ran into a peculiar difficulty. My red filter negatives began to come out extremely flat, and I can only suspect that the red filter had faded, so I have obtained a new set of filters, but have not had time to try them yet.

In conclusion, I would like to show a separation negative printing box, made by Mr. G. H. Wells. Again, I have not had a chance to try it, but I have seen some negatives made with it, and they seem quite good.

Projection of Transparencies

In showing some of his results through the lantern, Mr. Jeffress confessed that he had not been entirely satisfied

with the pictures, and since looking at the works in the First Colour Group Exhibition, he realised that he was only a tyro. He added that he had not tried masking except for one set of negatives which were handed to him to mask, but he intended to try it very shortly. He believed that masking would help to overcome the blue or grey veiling which was apparent in some cases, and which meant a considerable loss.

In reply to a question, he said that his purpose in printing through a piece of Dufay emulsion was to allow of the variation of Dufaycolor from neutral grey. Dufay itself—the rhizo—was not neutral grey, and by putting a piece of that rhizo over the neutral grey wedge, compensation could be made for that. To get a proper grey wedge on a Dufay he had a very under-exposed photograph. When he got the photograph right the grey wedge was over-exposed, and he thought he would just put the emulsion over it.

Exposure Calculations

In the course of further discussion Mr. Jeffress gave an example of his calculations for arriving at the exposures for the three colours. The calculation consisted of finding the anti-logarithm—for example, if the exposure for the red filter negative was 12 seconds, he took the difference in density between that and the green filter negative, found the anti-logarithm of it, and divided the 12 seconds by that anti-logarithm, giving perhaps nine seconds, and for the blue filter negative he multiplied by the anti-logarithm of the difference, giving perhaps 15 seconds, and from that he went ahead and made his test carbro. But he did make slight variations. If, for example, he got a slight excess of red, he cut down somewhat on his green filter negative.

On the motion of THE CHAIRMAN a hearty vote of thanks was accorded to both authors for their very interesting papers.

CINEMATOGRAPHY IN WAR TIME

I.—ENTERTAINING H.M. FORCES WITH 16 mm. FILMS

By Alexander Victor

At the Meeting of the Kinematograph Section of The Royal Photographic Society, held at 16, Prince's Gate, S.W.7, on October 17th, 1942, during the Society's Annual Exhibition, the first of a series of lectures illustrating some of the applications of cinematography to war time uses was given. The lecturer was Mr. Alexander Victor, of the Cinema Division of the Department of National Service Entertainment. Mr. Victor read an interesting paper on the rôle played by 16 mm. film in entertaining H.M. Forces.

Mr. Arthur S. Newman, Hon. F.R.P.S., was in the Chair.

MR. VICTOR, in his preliminary observations, dealt with the limited use to which sub-standard film was put prior to September, 1939. When war came not the fringe of its great possibilities had been touched. The 16 mm. projector and film were regarded by many as toys—albeit expensive ones. The pioneers of the industry never anticipated that the time would come when the Trade found it impossible to satisfy demands, although the authorities had marshalled its total productive capacity. He estimated that at the beginning of 1940 the total printing capacity of 16 mm. sound film was approximately one million feet per week,

which had now grown to almost two million feet.

A considerable proportion of the output is used by the Services as instructional films. The Ministry of Information also takes its share. But a very large amount of it is used for giving kinematograph entertainment to members of the Forces.

Mr. Victor then proceeded to trace the work undertaken by the Cinema Division of the Department of National Service Entertainment. Mr. Basil Dean had been appointed Director of Entertainment, Mr. Ben Henry Cinema Officer. "Our Section was located in the main Booking Office, but this accommodation was very

outgrown, and an extension was built in the main
ule, where maybe the shades of Garrick, Baddeley,
her ethereal visitors looked on with some bewilder-

desire was to serve men in camps well off the
track, sometimes in districts so remote that their
could not be found on a map. As the Mahomet of
my could not go to the mountain of the cinema, we
bring the mountain to Mahomet. Audiences might
anything between 30 and 1,200, but apart from
consideration we had to get cinematograph entertain-
to the troops, and that quickly; The Director of
tainment had said there must be no waiting.
a 48 hours seven 16 mm. mobile cinemas were on
ad. We thought we had accomplished something in
st week in arranging 48 performances. The machin-
however, was soon under way, and we worked in the
co-operation with the various officers in charge of
ainment in each area. We allotted a certain number
ile cinemas monthly to each Command, and these
n turn rationed to the various areas so that an
ble distribution was assured.

v greatly has the organising and distributing of this
ainment grown since then. First the Army, then
ir Force, troopships, hospital ships and overseas
is were serviced. It is no exaggeration to say that
the sun never sets on the British Empire, so where
the flag is flying we have sent 16 mm. films to enter-
ur fighting men.

very soon exhausted the supplies of 16 mm.
es. Our overtures to renters were received with the
cordiality; all the best releases were reduced to
1. for our work. The only "Thou shalt not" which
ade imposed was the obligation not to give per-
ances within two miles of a public cinema, and this
ve diligently honoured. In spite of this we have
ntly received from local exhibitors permission to
within the vicinity of their halls. Mr. Victor here
ularly stressed the value of this trade co-operation.
set of 100 mobile cinemas is capable of visiting 1,000
nt locations each week, and we have to ensure that
tion gets the same film twice. We now have our own
organisers throughout the country sitting in com-
with local Service representatives who know the
ements of every Service station in their district.
obile units may go to a searchlight station in an
-the-way locality and entertain a company of ten
a small hut; the next performance may be to an
ce of over 1,000. Journeys of 70 to 100 miles have
nade to entertain less than 50 men. The extent of
ea served can be gauged from the fact that for the
welve months for which figures are available we
d 1,111,896 miles. Between August, 1941, and
1942, we gave 17,792 mobile cinema performances
ceeded in mustering a total audience of 2,341,620.
programme consists of a feature film, supporting
and a news reel. Many of these programmes are
in areas long before the same films would normally
at the commercial cinemas. In fact, in 1940, we
howing films to our fighting men in France before
me subjects were exhibited in the West End of
n. We had 25 to 30 mobile units operating in
at that time, and we were giving cinema enter-
ent right in the front line, even in the Maginot
es. We know of the young heroes who in the big
t scrounged their equipment aboard the evacuating
and gave the worn-out Tommies a show to a back-
l of Jerry's music. More than once has a 16 mm.
en projected on a bullet-riddled screen during the

lay we are operating in every theatre of war. A
r service of 16 mm. films is sent by air or convoy to

Orkneys, Shetlands, Hebrides, Iceland, Faroes, Middle
East, West Africa, East Africa, Gibraltar, etc. There was
no doubt that the 16 mm. film, regarded as a rich man's
plaything, survived the prejudices to become a potent
factor in the preservation of morale.

The service is rendered absolutely free. Any man in the
forces can see, say, the latest Deanna Durbin film without
spending a penny. The standard attained has been built
up on a study of what the men want. At the inception we
introduced a system of unbiassed comments from the
men entertained. At every performance a report form is
left with the officer in charge, upon which to make his
observations, and this is linked with one from the opera-
tor. (Here Mr. Victor read a number of these reports
with their shrewd, appraising and sometimes amusing
comments).

A feature of Mr. Victor's reading was the pen-pictures
he painted in a successful attempt to capture the atmos-
phere prevailing at the majority of the stations visited.
He took his audience on a typical journey with its
attendant difficulties to an out-of-the-way station where
a mobile unit had to generate its own electric current, the
screen being propped up in the proverbial Heath Robin-
son manner. The audience sitting on low wooden forms
and tables soon settled down to one-and-three-quarter
hours of 16 mm. cinema entertainment.

"We watch the news reel and listen to such comments
as 'I saw that in the paper,' or 'That's where you live,
Bert'; the supporting short almost creates a riot of
laughter. During the showing of the feature film we take
our eyes off the screen for a moment to watch the faces of
the audience; there is perfect decorum and the intent-
ness and interest is kept up to a climax registering perfect
enjoyment, until finally the drums roll and His Majesty
The King appears on the screen, while the Guards' Band
peals out the National Anthem."

Perhaps the scene is a gymnasium at an R.A.F.
station where the audience is, if not critical, more dis-
criminating. Or again, it may be the parlour of a cottage
where a continuous performance is being given to twenty
men at a time, this being total parlour capacity. Yet
again, a hospital ship using its own projection equipment.
Sometimes these ships are at sea for months on end, but
ways and means are found of reaching them.

Here Mr. Victor quoted extracts from operators'
reports, one of which, by the way, showed how the writer
was instrumental in arresting four German flyers who
made a forced landing; another referred to an audience
wearing gas-masks. He went on to describe performances
given at construction camps where on more than one
occasion a crane had to be requisitioned to help equip-
ment over the rough tracks.

Further, a new service has been instituted whereby
hundreds of programmes are supplied to Service stations
for use with their own projectors. This service has the
advantage of giving the men independence of selection
and greater choice of date. On the other hand, these
films have often to be entrusted to amateurs, resulting in
the Department's examining and repair staff being
trebled.

Mr. Victor concluded by expressing the hope that
"with the impetus given to the sub-standard film by
to-day's needs it will never look back, and that when
peace is once more restored nothing will stand in the way
of the 16 mm. film taking its place as a potent factor in
the furtherance of civilisation."

Mr. Victor having replied to various questions, THE
CHAIRMAN, in thanking the lecturer, said that he had
made what might have been a very dry subject one of
romantic interest, and had both amused and impressed
his audience. There need be no fear that the 16 mm. film
would ever go out of use.

THE BOOKSHELF

Victorian Photography. Being an album of yesterday's camera work. Edited and introduced by A. Kraszna-Krausz. Selected and commented on by Alex. Strasser, F.R.P.S. The Focal Press, Ltd., London and New York. Price 13s. 6d.

This is the second volume of the *Classics of Photography*, a history of photography in photographs. In time it covers just over 60 years, and spans the whole period of the reign of Queen Victoria. There have been many less illuminating essays on the Victorian era than that which introduces this book. It was Burns who asked for the gift of seeing ourselves as others see us. Here we have a commentary from one who has not spent a great number of years here, but has obviously lavished much thought upon us, our institutions and our national psychology. The result is a penetrating analysis of the Victorian age, and more particularly of Victorian photography, which, whether we agree with it or not, is most stimulating. It is one more facet of the mind and personality of A. Kraszna-Krausz, to whom photographers in this country owe such a debt for his work on their behalf. It has been said of publishers, other than photographic, that after all they are but working for a profit. Such a point of view is as small and undiscerning as to be beneath contempt. There is a sense in which all of us are working for a profit, usually it is that profit that enables us to live, yet even the least among us will admit that our standards of achievement differ vastly from one another. The Focal Press, under Kraszna-Krausz, has produced a series of books on photography that have never been surpassed in the English language or in any other. They have claimed that utility is their aim; actually they have achieved much more, and we cannot be too thankful for the remarkable series of works they have supplied. Now they offer our own history to us, as well as the history of photographic progress through 60 years. Just as a gallery of pictures calls for exposition by a guide, so here is guidance provided. The pictures have been selected and are commented upon by Alex. Strasser. That does not mean a critical analysis of each picture; it does mean a lucid and entertaining sketch of the early days of photography, its inventions, its apparatus and methods, and its personalities. Incidentally, it quotes from a number of works long out of

print, but all to be found in the Society's Library, in which most of the early chapters of the history of photography are enshrined. Some day we shall have a fuller and better documented history than any we possess to-day. When that work is prepared this commentary of Alex. Strasser's will prove useful as a source book. Then there are the reproductions themselves, fifty-one of them, ranging in time from 1840 to 1910, and including work by Fox Talbot, Hill, Roger Fenton, Julia Cameron and most of the great names of the Victorian era. There are also a quarter of a hundred notes on biographies of the photographers.

There can be no question as to the value of looking back and rightly assessing the quality of achievement of those who have gone before; only so can we arrive at a true valuation of our own position and progress. This volume should prove peculiarly salutary in this direction, for one has the work of the old masters and their story with modern comment and analysis. The work of reproduction has been well done, and it is difficult to think of any volume at the moment which could provide more acceptable fare than this for any photographer, whether amateur or professional.

H. W. GREENWOOD.

Photograms of the Year 1943. Edited by F. J. Mortimer, C.B.E., F.R.S.A., Hon. F.R.P.S. Published by Iliffe and Sons, Ltd. Price 7s. 6d. paper covers, or 10s. cloth boards.

The forty-eighth annual volume, the fourth issued during the war, is an astonishing production. It is in almost every respect the equal of anything this publication achieved before these present unhappy times, and it is only in respect of news from the warring countries that it noticeably falls short, and that of course is merely because it is the victim of circumstances. In paper, printing, make-up and illustrations it is as good as any of its predecessors. It remains, as before, the invaluable record of another year of photographic history in the pictorial sphere, supremely well done.

The plan is the same as that to which we have become accustomed in the past. The editor surveys the happenings of the year and also contributes a detailed and illuminating commentary on the pictures reproduced. Several eminent photographers have sent accounts of conditions and activities, naturally curtailed during the past year, in their

respective countries, a well-diversified selection of seventy-four pictures forms the most important feature, and finally there is the very useful directory of photographic societies. The pictorial reproductions are in half-tone of a very high standard of quality. Altogether it is an outstanding achievement in war time.

J. D. JOHNSTON.

Home-made Papers, Films and Plates. By C. I. Jacobson, Ph.D. **Switching over to 35 mm. Film.** By W. D. Emanuel. Photo Pamphlets. The Focal Press, Ltd., London and New York. Price 2s. 6d. each.

The first two numbers of a new series of Photo Pamphlets produced by the Focal Press to meet present conditions and help photographers to tide over these difficult times. Their titles explain what they are about, the fact that they are Focal Press products is an assurance that they adequately fill their purpose. Of the timeliness of their appearance there can be no doubt, and they are well within the means of the humblest camera user.

Each is as complete as it is possible in the compass of such a pamphlet, there are nearly 15,000 words and about 50 diagrams to each subject. In a word, they are tremendously concentrated compendia of the essential information to enable any intelligent photographer either to prepare emulsions and to coat them himself, or to switch over from larger sizes of negative material to 35 mm. film.

Information on these matters has been available before, but never in so compact a form, and most certainly never at the price it is now offered. Once again the Focal Press has seen a need and provided the material for it in its own unique manner. Such service may not be recognised at its true value by all, but there can be no doubt of the debt which photography owes to the Focal Press, and this latest development adds very materially to it.

H. W. GREENWOOD.

Table-Top Photography. By Henry G. Russell, A.R.P.S. The Fountain Press, 11-13, Bream's Buildings, London, E.C.4. Price 5s. net.

Mr. Henry G. Russell, under his pseudonym "Minicam," is well known to a wide circle of photographic readers; he has written with particular acceptance on home portraiture and on the miniature camera. This latest book of his is an excellent piece of work, it is packed with practical hints and provides the best guide extant to table-top photography. Not only is it a guide to method and

it is equally fertile in as the author well says, able-top picture without ; hopeless as building a at a plan." ; the build-up of subjects letail, but the conditions behind the build-up are , so that not only does receive hints in the concenes, the making of lay irt of simple modelling, omposition and perspecled, and each final set-up am showing how the hieved.

excellent elementary table-top photography, adequately illustrated, bly good value for these 1 be thoroughly recom-

H. W. GREENWOOD.

Amateur Photographer Handbook for 1943. om the offices of *The Photographer*, London,

diary is once again ready, d with most diaries avail- velloously compact com- diary for the amateur . There are 45 pages facts and formulæ the requires every day of much additional inform- e often wastes a great ooking for. It is all here, ith a page to a week, an rd of far larger capacity s restrictions are likely d a most comprehensive le. It is obtainable from f *The Amateur Photo- et House*, Stamford St., .1, and the price of les purchase tax.

H. W. GREENWOOD.

to-Lab-Index

: supplement to the dex has reached the ess, from whom we hat the present position e Photo-Lab-Index is ow available in two ich, including supple- No. 14, costs 63s. + 5s. ving to the present in- ictions on importations try, copies can only be hose who definitely re- lome for business or oses.

rticulars may be ob- the Fountain Press, 's Buildings, Chancery u, E.C.4.

ADDITIONS TO THE LIBRARY

Mertle, J. S. Color reproduction of screen-plate images, including reproduction of Kodachrome originals. St. Louis n.d. pp. 31. ill.

— Direct halftone color photo- graphy. St. Louis n.d. pp. 26. ill.

"A summary of technique and procedure in the production of halftone color separation negatives."

— Principles of dot etching. St. Louis n.d. pp. 25. ill.

The illustrations consist of photomicro- graphs, showing actual halftone dot forma- tions in the various stages of reduction.

— Process photography and plate making: a practical manual for the graphic arts. Revised edition. St. Louis 1940. pp. vi+179. ill. \$1.50

Mortensen, William. Flash in modern photography. Supplemen- tary notes by **Don. M. Paul**. San Francisco 1941. pp. 208. ill.

After describing the construction and be- haviour of flash bulbs, synchronization and exposure, Mortensen deals with flash photo- graphy from the point of view of the picto- rialist. The section by Paul represents the professional use of flash.

— The new projection control. 3rd edition. San Francisco 1942. pp. 123. ill. \$2.75.

In this edition the author has laid less em- phasis on the freakish and "trick" uses of projection control than in earlier editions, and gives a much fuller description of the various procedures, with special emphasis on the application of Projection Control to ordinary portrait and landscape photo- graphy.

New Photo Guide. No. 2. All about focussing and your camera. By **F. W. Frerk**. London 1940. pp. 53. ill.

— No. 3. All about filters and your camera. By **C. I. Jacobson**. Lon- don 1941. pp. 54. ill.

— No. 4. All about portraits and your camera. By **Hugo van Wadenoyen**. London 1941. pp. 53. ill.

— No. 5. All about exposure and your camera. By **C. I. Jacobson**. London 1941. pp. 53. ill.

— No. 6. All about the right moment in action photography. By **Alex. Strasser**. London 1941. pp. 53. ill.

— No. 7. All about land, sea, sky and your camera. By **Hugo van Wadenoyen**. London 1941. pp. 53. ill.

— No. 8. All about formulæ for your darkroom. By **C. I. Jacob- son**. London 1941. pp. 52. ill.

— No. 9. All about daylight indoors. By **Hugo van Wadenoyen**. London 1941. pp. 52. ill.

— No. 10. All about improving negatives. By **F. W. Frerk**. Lon- don 1941. pp. 50. ill.

— No. 11. All about winter photography. By **Edwin Smith**. London 1941. pp. 50. ill.

— No. 12. All about tracing troubles in your photographs. By **A. Merryweather**. London 1941. pp. 54. ill.

— No. 13. All about one lamp only. By **Hugo van Wadenoyen**. London 1941. pp. 48. ill.

— No. 14. All about the second lamp. By **Hugo van Wadenoyen**. London 1941. pp. 48. ill.

— No. 15. All about composition. By **A. Kraszna-Krausz**. Lon- don 1941. pp. 51. ill.

— No. 16. All about better prints for your darkroom. By **F. W. Frerk**. London 1941. pp. 50. ill.

— No. 17. All about against the sun effects. By **Hugo van Wadenoyen**. London 1941. pp. 53. ill.

— No. 18. All about photos in the garden. By **R. M. Fanstone**. Lon- don 1941. pp. 50. ill.

— No. 19. All about copying. By **H. W. Greenwood**. London 1941. pp. 53. ill.

— No. 20. All about making en- largements in your darkroom. By **C. I. Jacobson**. London 1941. pp. 54. ill.

— No. 21. All about processing in your darkroom. By **C. I. Jacobson**. London 1941. pp. 54. ill.

— No. 22. All about architecture and your camera. By **R. M. Fan- stone**. London 1941. pp. 49. ill.

— No. 23. All about selling photo- graphs. By **Bernard Alfieri**. London 1941. pp. 54. ill.

N. P. Handbook. No. 5. Photo- graphic filters: their uses and ad- vantages. By **Bertram Thomas & Johnson Glover**. London 1927, reprinted 1939.

— No. 11. After-work on negative and print. By **R. M. Fanstone**. London 1939.

— No. 13. On holiday with a camera at the seaside, in the country. By **Robert H. Goodsall**. London 1939. pp. 57. ill.

— No. 14. Against the light (*contre-jour*) photography. By **Robert H. Goodsall**. London 1940. pp. 62. ill.

ITEMS OF INTEREST FROM VARIOUS QUARTERS

The Pirie MacDonald Bequest

Elsewhere in this issue ("R.P.S. Proceedings: Council Meetings") the bequest to The Royal Photographic Society of five thousand dollars under the will of the late Mr. Pirie MacDonald, Honorary Fellow and for some years an Honorary Foreign Corresponding Member of the Council in America, is formally recorded.

It was in no spirit of formality, however, that the Council received the intimation of this generous benefaction, and Members of the Society will share the feeling of the Council that it is a final demonstration of the interest and affection that its donor always cherished for the Society.

Pirie MacDonald was throughout his association with the Society its loyal friend and supporter. We have no reason to doubt that he would have been its doughty champion if the need had ever arisen for the championship of one whose opinions were as strong as his impulses were generous.

Pirie MacDonald's association with the Society lasted for almost exactly twenty years, and we know how much he prized it, the pride it gave him. That pride was not on one side only. The Society too was proud and privileged to include him in its membership. If societies can add to the stature of lesser mortals, great men add to the stature of societies. Pirie

MacDonald was such a man and the Society values the esteem and affection which he held for it.

Materially, the legacy is most welcome and helpful as an addition to the Society's general funds. While he made no stipulation as to its disposal, he would have approved of any course which would contribute to the financial welfare and stability of the Society. Its noble house at Prince's Gate, which he visited on the occasion of his last visit to London, before, however, the Society had moved in, greatly appealed to him. The ownership of property involves liabilities which make a substantial reserve fund a necessity, and the addition of this generous bequest to the Society's reserves will serve in a changing world to help to improve its prospects for the future.

When a man with the strong character, the unfailing energy, the wide interests, the compelling personality of a Pirie MacDonald passes away he leaves a sense of loss which time with all its gentle solicitude and kindly care can never wholly heal. To those who were near and dear to him such a bereavement is irreconcilable, and we can only again, in recalling our profound admiration for the man and his work, renew the expression of our sincere sympathy with his widow and daughter in their truly irreparable loss.

Sitters with Glasses

In an article in the October, 1942, issue of *Minicam Photography* (Cincinnati, U.S.A.), Mr. John Hutchins, writing on the difficulties of photographic models wearing glasses, summarises his conclusions as follows:—

1.—Lower the main light source and secondary light just enough to light the eye sockets adequately and still avoid reflections. You will find that it is possible with a little patience to find this exact spot with most eye-glasses.

2.—It is sometimes impossible to photograph subjects with deep-set eyes wearing sharply convex lenses without getting some reflections. These subjects should change their glasses for a portrait sitting. I always keep three pairs of nearly flat field glasses readily available as props. (Small, medium and large sizes). These glasses are optically ground and only slightly convex.

Extremely convex lenses make the eyes appear smaller than without glasses.

Here is a point in favour of your flat field glasses: They do not shrink the pupils and eye-balls. The subject naturally will not be able to see as well with almost flat field glasses. I have found the expression in the eyes usually is much softer and more appealing by this change. Caution the subject to close the eyes just before the exposure for a few seconds. When you are all ready to shoot, the sitter should open the eyes and not attempt to distinguish or focus on any object in the room.

This procedure will avoid all annoyance of light reflections.

3.—It is possible to photograph any subject wearing eye-glasses without lenses. The absence of the glass will not be detectable in soft-focus portraiture. In needle-sharp

photography you will almost notice the difference immediately. These empty frames will look in the finished print. Another point to this method is that some slight curve of an actual front of the eye, the habitus looks strange and unnatural; eyes will appear slightly fishy looking. Try it yourself.

4.—Beware of any type of glasses. They hold back light and cause light reflection.

All eye-glass lenses offer resistance to light penetration (six per cent to ten per cent).

Polaroid lenses reduce reflection and glare. Coating the lens optically reduces reflections. These methods only reduce, not entirely eliminate reflections.

Remember, here is the important point—both of these methods reduce, but do not entirely eliminate reflections.

5.—Concave lenses reflect less light than any other type. They are like those invisible-glass windows that are so easy to see through. Unfortunately, you scarcely ever find a subject wearing them. They would be the best glasses for studio props.

6.—Light-coloured transparent frames are the most flattering for portraiture. They do pick up some light on the frames, but the lights only add a certain sparkle to the *total ensemble*.

Final axiom: Raise the lights to avoid reflections, don't put them to the side.

Variable Focus Lenses

Mr. J. M. Bing, F.R.P.S., York, Honorary Foreign Corresponding Member of the Council, sends the following extract from the *York Times* of 1st November

"A lens for microscope changes its focus by changing shape instead of its position in the instrument on which Pate 2,300,251 was issued to Edw. Flint of Brighton, N.Y. The new lenses of this type, but according to Mr. Flint, shape-changes introduced a new principle which largely destroyed the need for variable-focus lenses. The new lenses are made to change their shape by introducing more or less liquid pressure. In the present invention the distribution of pressure is controlled and distortion prevented, by the use of transparent diaphragms within their cavities.

"Mr. Flint has assigned his invention to the Bausch & Lomb Optical Company."

Oklahoma Salon

Oklahoma International Salon photography will be held in the auditorium from January 14th, 1943.

Entry for receiving prints is 1, and as time is getting advised by the organisers submitting prints entry need not write for and if they will forward unmounted every attention given them both as to mounting and exhibition.

Once is given that the exhibition is conducted according to the Society of America

should be marked "Photography exhibition only—no value—to be returned to not more than four prints submitted by any one exhibitor. Entry fee is one dollar. Prints will be mounted and in glass.

For forwarding prints and publications regarding the Oklahoma International Photography, 900 Commerce Building, Oklahoma City, U.S.A.

on Composition

Article in *American Cinephile* for June, 1942, entitled, "Composition work for you," by Annura, A.S.C., writes: "Many people consider composition something 'arty' and a matter of making your picture attractive to look at, but very far removed from the fundamentals of the practical picture."

Nothing could be more true. Composition is a very basic of guiding the audience to whatever is most important in a scene—emphasising what should be emphasised, and giving what is of lesser importance are three chief means in a motion picture composition, *tone* (or, in Kodachrome, *color*), and *motion*. Usual composition we may put all three to work in combinations. If we make for us, the result is not a 'good' composition, but a story its own best and its own way. If we let them tell us, the scene is likely to be a poor composition, but hard-to-follow dramatically. The first thing to about using position for emphasis is the fact we look at any picture painting, photograph or eye subconsciously starts

in at the lower left-hand corner, and moves diagonally upward toward the upper right-hand corner, unless something intervenes along the way and diverts it along some other course. There it's best, if you can, to try to place whatever in your scene is most important somewhere along this upward left-to-right diagonal. If you can't do this, have something—it needn't be very big; it can even be a twig or a splotch of shadow if it's in the right place—athwart this line to divert and re-direct attention toward your principal object of interest." The article also deals with such points as "whatever is nearest the camera is likely to be the dominant factor in a composition"; "tone and colour values can make or mar a compositional emphasis, perhaps more strongly than anything else."

War-Time Care of Projectors

An article on "War-time Conservation in Theatre Projection," containing a useful ten-point programme on the care and maintenance of equipment designed to conserve vital materials, reduce waste, salvage worn-out parts, and to enable the motion picture theatres to carry on during the present emergency, appears in the June, 1942, issue of the *Journal of the Society of Motion Picture Engineers*.

Association of Scientific Workers

The Exhibition of Photography in Science and Industry at The Royal Photographic Society in November



A section of the lantern slide case in the R.P.S. Annual Exhibition, photographed by the light in the case by Percy W. Harris, F.R.P.S.

was shown at Liverpool last month, and will be held at the Exhibition Hall, Central Library, St. Peter Square, Manchester, from January 2nd-16th. It will be open daily (excluding Sundays) from 9 a.m. to 6.30 p.m. Admission is free. It is to be opened at 2.30 p.m. on January 2nd by Dr. G. S. Smith, the Director of the Manchester Municipal Pathological Services.

It will then proceed to Oxford, Bristol and several centres in the Midlands.

War Pictures

The second Exhibition of War Pictures by members of the British Press Photographers' Association opened last month at the Ilford Galleries, 101, High Holborn, W.C.1.

We understand that the Exhibition will remain open until about the middle of next month.

APPARATUS AND MATERIALS

Johnson's Universal Film Cement

Johnson and Sons, Manufacturing Chemists, Ltd., Hendon, London, N.W.4, have submitted for test a sample of their new "Universal" Film Cement, designed to be of equal use with either normal 35 mm. nitrate or sub-standard acetate (safety) film.

The water-white, slightly viscous solution, smells very strongly of acetic acid, leaves a whitish deposit on the plates of the splicer, and tends to cause the latter to rust a little if it is not cleaned after use. The slight

viscosity enables the solution to be controlled on the splice, and it does not tend to spread over the surface of the film. It makes a good strong splice with both types of film, but must be used somewhat sparingly, as otherwise there is a tendency for the film to buckle.

This is a very welcome and most efficient addition to the already wide range of aids to cinematographers and photographers which is put out by this firm. G. H. SEWELL.

R. P. S. PROCEEDINGS COUNCIL MEETINGS

A SPECIAL Meeting of the Council was held at 16, Prince's Gate, S.W.7, on November 23rd, 1942, when the following were present: The President, Mr. D. MacMaster, in the chair; Messrs. Marcus Adams, A. J. Bull, A. J. Catford, A. E. Dent, Percy W. Harris, T. Midgley Illingworth, J. D. Johnston, R. H. Lawton, F. J. Mortimer, Arthur S. Newman, J. H. Pledge and G. C. Weston.

The Secretary reported the receipt of a letter from attorneys in New York acting in the estate of the late Mr. Pirie MacDonald, together with a copy of Mr. Pirie MacDonald's will, under clause 4 of which the Society is entitled to a legacy of 5,000 dollars together with the Form of Discharge

in respect of the legacy which the attorneys wished to have executed under the Common Seal of the Society.

The meeting adopted a special resolution authorising the Common Seal of the Society to be affixed to the document in question.

An Ordinary Meeting of the Council was held at 16, Prince's Gate, S.W.7, on December 14th, 1942, when the following were present: The President, Mr. D. MacMaster, in the chair; Messrs. A. J. Bull, A. J. Catford, J. H. Coote, A. E. Dent, Fred Green, Percy W. Harris, G. E. W. Herbert, T. Midgley Illingworth, J. D. Johnston, R. H. Lawton, F. J. Mortimer, Arthur S. Newman, Oliver G. Pike, J. Pledge, S. Schofield, Thomas H. B. Scott, F. J. Tritton, C. Waller and G. C. Weston.

New Members

The following Candidates were nominated for Membership:—

William Roger Anderson, 3, Meadow Road, Beeston, Nottingham. (Member, Nottingham and Notts Photographic Society.)

Ernest John Andrews, 39, Hill Road, Wimbledon, S.W.19.

Maurice Albert Allsop, 126, South View Road, Sheffield 7. (Member, Sheffield Photographic Society.)

Harold Austin Bassett-Lowke, 18, Albion Place, Northampton.

Lloyd Vernon Bates, 410, Dudley Road, Birmingham 18.

John Henry Bayley, Pemberley, Portraeth, Redruth.

William Beetham, 14, The Corners, Thornton Gate, Clevellys, nr. Blackpool.

William Bissett, Ibrox Post Office, Glasgow, S.W.1.

Wilfred James Brown, 9, Dawlish Drive, Pinner.

Margaret Bourke-White (Miss), c/o *Time and Life*, Ltd., 4, Dean Street, London, W.1.

Arthur Blakey, 22, Station Road, Baildon, Yorks. (Member, Bradford Camera Club).

Robert William Burt, 109, Queenboro' Road, Sheerness, Kent.

A. J. Caithness, Lime House, Coal Wynd, Kirkcaldy.

John Owen Cannam, B.Sc., D.L.C. (Hons.), c/o Mr. A. Wheelhouse, Yonda, Foljambe Avenue, Chesterfield. (Member, Chesterfield Photographic Society.)

William Albert Caro, B.Sc., A.I.C., F.C.S., 63, Musters Road, West Bridgford, Nottingham. (Member, Nottingham and Notts Photographic Society.)

Harry Chapman, 22, Sydney Street, Stratford, Manchester. (Member, Manchester Amateur Photographic Society.)

Frank Greenwood Clegg, I.C.I. (General Chemicals) Ltd., Wigg Works, East, Runcorn.

Denis Crowley, 53, Mobhi Road, Glasnevin, Dublin. (Member, Photographic Society of Ireland.)

Andrew D'Arcy, Pantlludw, Machynlleth, Montgomeryshire.

John Arthur Dixon (Capt.), The Gateway, Luccombe, Shanklin, Isle of Wight.

Eric Norman Dodd, Ph.D., A.I.C., Holmesthorpe, Glebe Park Avenue, Beilhampton, Hants. (Member, Petersfield Photographic Society.)

James Donald Donlevy, 11, Hansen Avenue, Bramley, Leeds. (Member, Armley and Wortley Photographic Society.)

George Renato Doran, 26, Rutland Street, Fife.

George Edgar Gregory, 2, Kennett Close, Norwich. (Member, Norwich and District Photographic Society.)

Harold Hiles, Stanmer, Breinton Road, Hereford.

Edward Harman, Medical Hall, Carrick-on-Shannon, Eire. (Member, Photographic Society of Ireland.)

John Rowland Hodge, M.B.E., Woodcote Upham, Hants.

Maurice Parker Ingram, 67, Marlborough Park South, Belfast.

Donald Junor, Eagle House, Aberdovey. (Member, Photographic Miniature Postal Portfolio.)

John Charles Kingcome, B.Sc., A.I.C., 13, Woodbury Avenue, Petersfield, Hants. (Member, Petersfield Photographic Society.)

Cornelius Henry Lee, 19, Taptonville Road, Sheffield 10.

David Price Lewis, 33, North Albert Road, Norton, Stockton-on-Tees.

William Henry Marquis, 3, Wood Welwyn Garden City, (Mer Plate Postal Club).

Albert Marriion, 12, Victoria Gar Grove, Oxtou, Cheshire. (Mem pool Amateur Photographic A William Francis Nuttall, 47, 1

Walton-on-Thames. (Member, Amateur Photographic Society Charles Robert Oswin, 2, King Squ water.

Wm. Perrett, Agfa-Ansco Corpora hampton, New York, U.S.A.

Frederick W. Ricks, 19, Comp Sherwood, Nottingham. (Mer tingham and Notts Photograph F. P. Schulz (Dr.), 26, Chessing London, N.3.

Charles Ernest Sexton, M.I.E.E., Redhill.

Charles Parr Straw, 61, Highf West Bridgford, Nottingham. Nottingham and Notts Ph Society).

Helen Doris Poynter Stewart (A goyne, Warren Drive, Kingswo (Member, Photographic Miniat Portfolio).

Eric Spencer Stewart, Wyvern, combe Road, Alverstoke, Gospo ber, Petersfield Photographic ; Gottfried Spiegler, F.Inst.P., 1

Cancer Hospital, Fulham Road Samuel Simons, 2, Francis Road, N. A. M. Swettenham (Lt.-Col., R cote, Little Barrington, Oxon.

James Swarbrick, Swarbrick St George Street, London, W.1.

Leonard Charles Voke, "No Barnby, nr. Beccles, Suffolk.

Norwich and District Ph Society).

Albert Victor Weatherhead, F.R Bourne View, Greenford, Midd Howard Wilson, Tiry-coed, Roe ' Conway.

George Henry Waumsley, 18, Park Armley, Leeds 12. (Member, A Wortley Photographic Society)

Reginald Wilsher, 2, Corporatic Chesterfield, Derbyshire.

Chesterfield Photographic Societ Raymond Bradley Woodall (S

geants' Mess, R.A.F., Sawbri Herts. (Member, Southampto Club).

Edward Watson, 32, St. Ann's Burley, Leeds 4. (Member, Ar Wortley P.S.).

JUNIOR MEMBERSHIP

Bernard Behrens, Station Hous Halling, nr. Rochester, Kent.

George William Lewis Moore, 1 Warden Road, Liverpool 28.

Henry Smith (I.A.C., 628459), 55 : R.A.F., M.E.F.

Gwendoline Wilsher (Mrs.), 2, C Street, Chesterfield, Derbyshire ber, Chesterfield Photographic S

J. A. Zeal, 199, Sebert Road, Fo London, E.7.

andidates who were nominating the Meeting of the Council November 9th, 1942 (*see* p. cember, 1942, issue this were elected to Membership.

The Council regretted to learn of the death of Mr. Alex. F. W. Associate), of Whitefield,

ble Society

The Council received the following much appreciation:

Today's annual meeting Oval Society voted you warm regards and heartfelt wishes for Christmas and victory to Allied Nations.

Joseph Bing."

resolved that the greetings be acknowledged and read in the warmest possible

the Agricultural Record Committee

In response to an invitation to appoint representatives of the Berkshire Architectural Committee, the Council had in nominating Mr. Marcus F.R.P.S., and Mr. Parsons K. M. Parsons, F.R.P.S.

aylor Memorial Lecture

The Council had pleasure in supple nomination of Mr. E. R. .Sc. (Fellow) as the Lecturer 3th Traill Taylor Memorial and in learning that subject of invitation had been accepted by Mr. Davies.

The Council accepted the following much appreciation:—

Photographs illustrating Ophthalmic by and from Squadron Leader Hinton, R.C.A.F., Ottawa, Canada

Donation of seventeen books on photography: Mr. G. C. Weston (Fellow): The Colourist (The Nutshell Series); The Antennae (The Nutshell Series); The Drawing, by John Ruskin; The Architecture, by John Ruskin; The Camera, by John Ruskin; Photography The Premier Handbook; Carbon Making Easy, by Thomas Illingworth; Photography, by Bertha M. The Story of Photography, by Percy; Photography for the Press, by Hinton; Platinotype Printing, by Hinton; P.O.P., by A. Horsley; Our Printing, by W. D. Richmond; The Making, by John A. Hodges; Landscape Photography, by J. C.

Warburg; The Photographer's Concise Dictionary, by Rev. F. C. Lambert; The Techniques of the Hand Camera, by W. B. Coventry.

A copy of "Shooting the Russian War," written and photographed by Miss Margaret Bourke White, of New York (Simon and Schuster, New York, 1942). From Miss Margaret Bourke White. For the Library.

A copy of "A New A B C in Colour Photography," designed by George A. Adams, photographed by Paul Henning (Member). (London:

Collins). From Mr. Paul Henning (Member). For the Library.

A copy of "Cinderella"—A Fairy Tale in Colour Photography. Illustrated by George A. Adams; Colour Photography by Paul Henning (Member). Dolls designed and made by Amalia Serkin. (London: Collins). From Mr. Paul Henning (Member). For the Library.

Kodak Bulletin of Current Photographic Information: back numbers for inclusion in the Library, from Messrs. Kodak, Ltd.

KINEMATOGRAPH SECTION

Film Advice Bureau and Criticism Service

Correspondence from members of the Kinematograph Group has shown that there is a real need for an "Advice Bureau," and, accordingly, the services of experts on various aspects of cinematography have now been enlisted to advise on technical and production problems. The honorary secretary will refer enquiries promptly to the appropriate authorities.

A Film Criticism Service is now operating and it is hoped that members will make use of the facilities.

The procedure is quite simple. In the first place write to the secretary giving him details of the film to be criticised, namely, length, width and title. He will later advise you when, how and to whom the film should be forwarded. It will be viewed by the committee and returned with the least possible delay. The criticism, which will be signed by at least one member of the viewing committee,

will follow within the next week or so.

The main thing to remember is not to send a film until requested, the object of this being to collect details of a number of films which can be called in and viewed at one session. Return postage should be contributed by the member. Although every care will be taken of films, the committee cannot accept responsibility for any damage which they may receive in transit or during the time that they are in their hands. Mr. Percy Harris, F.R.P.S., Mr. George Sewell, A.R.P.S., and Mr. G. C. Weston, F.R.P.S., are the permanent members of the Criticism Committee, and they will have the power to co-opt specialists in any field of cinematography.

Communications regarding Kinematograph Group matters should be addressed to the honorary secretary, Mr. Stanley Schofield, F.R.P.S., Sheridan, 4, Norwood Drive, North Harrow, Middlesex.

MINIATURE CAMERA GROUP

Annual General Meeting

The Annual General Meeting of the Miniature Camera Group will be held at 16, Prince's Gate, Kensington, S.W.7, on Saturday afternoon, 27th March, 1943, at 3 p.m.

The Secretary's report and the Hon. Treasurer's accounts will be presented to the Members at the meeting.

The present Committee, whose names are given below, comprise those who have been entrusted with similar duties during the last two years. It is thought that fresh blood may be desired on the Committee; further nominations may be made by post to the Hon. Secretary, or at the Annual General Meeting.

MINIATURE CAMERA GROUP COMMITTEE: *Chairman*—Mr. Percy W. Harris, F.R.P.S.; *Hon. Secretary*—Col. W. Symon, A.R.P.S.; *Hon. Treasurer*—Mr. R. H. Lawton, F.R.P.S. Messrs. Stanley W. Bowler, F.R.P.S., Olaf Bloch, F.R.P.S., The Hon. M. W. Elphinstone, F.R.P.S., Messrs. D. McMaster, F.R.P.S., G. B. Macalpine, B.Sc., H. S. Newcombe, F.R.P.S., Paul Shillabeer, F.R.P.S., Dr. D. A. Spencer, F.R.P.S.

Immediately following the formal business of the above Meeting, there will be another of the very popular print criticisms, based on the pictures selected and hung in the Group's Annual Exhibition, open during the month of March. These criticisms will be made jointly by Mr. D. McMaster, F.R.P.S., and Mr. Richard N. Haile, F.R.P.S.

While every endeavour is being made to keep the Group's addressograph up to date, it is possible that some letters, exhibition entry forms, etc., may have gone astray. We would request Members, therefore, to notify any change of address.

W. SYMON,

Hon. Secretary,

Miniature Camera Group.

ANNOUNCEMENTS

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2 2s. 0d.; Group subscriptions, which became due for renewal on the same day, are as follows: Scientific and Technical Group, 7s. 6d.; Pictorial Group, 5s.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s.; Kinematograph Section, 5s.

Group subscriptions may be included with the Annual Subscription, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscriptions to the Society through their own Bank to The National City Bank of New York in New York, or direct to The National City Bank of New York. Such subscriptions should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square Branch, London, account. Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to ask them to mention their names, addresses and status (Fellow, Associate, Member); and Members making the remittance direct to The National City Bank of New York are requested to give this information.

It is important to note that payment should be made

"For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the same time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

LECTURE SESSION

The following meetings will be held at 16, Prince's Gate, S.W.7 (unless otherwise stated):—

Saturday, January 2nd, 3 p.m. Lantern Lecture, "Hebridean Memories." By G. B. Kearney, F.Z.S., M.B.O.U., F.R.P.S.

Friday, January 8th, 6 p.m. Informal Meeting of the Pictorial Group. "My Experience with Children in their Homes." By Marcus Adams, F.R.P.S.

Saturday, January 9th, 3 p.m. Meeting arranged by the Pictorial Group. "The Exposure Meter and the Pictorial Photographer." By Percy W. Harris, F.R.P.S.

Saturday, January 16th, 3 p.m. (1) Meeting arranged by the Kinematograph Section. "The 16 mm. Film and the Dynamics of Living Matter." By J. Yule Bogue, Professor of Physiology, Nuffield Institute for Medical Research. (2) Meeting arranged by the Colour Group, 3 p.m. "Colour Photography Can It be Art?" Discussion to be opened by V. P. Milner, A.R.C.A.

Friday, January 22nd, 6 p.m. Informal Meeting of the Pictorial Group. "Photography by Sea and Air in War and Peace." By Charles E. Brown, A.R.P.S.

Saturday, January 23rd, 3 p.m. Meeting arranged by the Miniature Camera Group. "What the Miniaturist would like after the War." By Percy W. Harris, F.R.P.S.

Saturday, January 30th, 3 p.m. Projection Optics. By Arthur S. Newman, Hon. F.R.P.S.

Saturday, February 6th, 3 p.m. Meeting arranged by the Colour Group. "Separation Negatives from Dufaycolor Originals." By Major A. B. Cornwall-Clyne, F.R.P.S., and C. H. Beale, A.R.P.S.

Saturday, February 13th, 3 p.m. "Photography's Part in the War," (third year). By F. J. Mortimer, C.B.E., Hon. F.R.P.S., F.R.A.S.

Saturday, February 20th, 3 p.m. Meeting arranged by the Kinematograph Section. Cinematography in War Time. No. 4. "Film Making with the R.A.F." Squadron Leader D. N. Twist.

Saturday, February 27th, 3 p.m. Meeting arranged by the Miniature Camera Group. "Multi-grade and the Latest Technique in Using this Paper." By L. V. Chilton, F.R.P.S., of Ilford, Ltd.

Saturday, March 6th, 3 p.m. Meeting arranged by the Pictorial Group. A Talk by Lancelot Vining (Fellow).

Tuesday, March 9th, 8 p.m. Annual General Meeting. Members, Associates, Fellows, only.

Saturday, March 13th, 2.30 p.m. Annual General Meeting of the Colour Group. 3 p.m.—"Making Colour Prints." By Jack H. Coote, F.R.P.S.

Saturday, March 20th, 3 p.m. Meeting arranged by the Kinematograph Section. "Sight and Sound in Sub-Standard Colour Film and Slow-Speed Recording." By Rex Calvert and Alex. Waters. Tanar (British) Corporation.

Saturday, March 27th, 3 p.m. Annual General Meeting of the Miniature Camera Group, followed by Technical and Pictorial Criticisms by D. McMaster, F.R.P.S., and Richard N. Hallé, F.R.P.S.

JOINT MEETINGS

We have pleasure in announcing the following arrangements for Joint Meetings. Arrangements for similar Joint Meetings are being made by other Societies, and will be announced in due course.

Birmingham Photographic Society, York House, Great Charles Street, Birmingham 3.

Saturday, January 16th, 2.45 p.m. Display of Films by the Film Officer of the Birmingham Branch of the Ministry of Information. (1) "Control Room"; (2) "Kill or be Killed"; (3) "Listen to Britain"; (4) "The Harvest Shall Come."

Bradford Photographic Society, Mechanics' Institute, Bradford.

Saturday, February 13th, 3 p.m. "Gum-Bichromate Multiple Printing: Some Recent Experiments." By G. Halford, A.R.C.A., F.R.P.S.

Manchester Amateur Photographic Society, 49, Lower Mosley Street, Manchester.

Saturday, January 16th, 3 p.m. Lecture by Eric Hosking, F.R.P.S.

Saturday, February 6th, 3 p.m. Lecture by D. McMaster, F.R.P.S.

Rotherham Photographic Society, The Crofts, Moorgate, Rotherham, Sunday, March 14th, 3 p.m. "Old Rotherham." By Miss D. Green and T. Salvin.

EXHIBITIONS AT 16, PRINCE'S GATE

January 4th to 30th. (1) The Photographic Alliance Competition Prints and Slides, 1942; (2) Dog Portraits, by A. S. Mawhinney, F.R.P.S., of New York.

February 4th to 27th. Prints by Members of Manchester Amateur Photographic Society, 1942.

March 4th to 31st. Miniature Camera Group Members' Exhibition.

April. Prints by Overseas Readers of *The Amateur Photographer*.

May. Central Association of Photographic Societies' Annual Exhibition.

June. (1) Pictorial Group Members' Annual Exhibition. (2) Spanish Cathedrals and Churches. By J. R. H. Weaver, M.A.

July. (1) *The Amateur Photographer* Prize Competition Prints. (2) Colour Photography.

Sept.-Oct. R.P.S. Annual Exhibition.

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Fellowship and Associateship

Notice is hereby given that applications for the Fellowship and Associateship in all Sections will be considered by the Advisory Committees appointed by the Council. Associates desiring to take up the Fellowship, and Members desiring to take up the Associateship in any Section, should address their applications to the Secretary not later than April 1st on forms to be obtained from him at 16, Prince's Gate, S.W.7.

The Advisory Committees in all Sections will meet half-yearly in future, in April and October.

R.P.S. MEMBERSHIP

In order to stimulate a more direct interest in the activities of the R.P.S. among members of affiliated societies, and at the same time to afford officials an incentive to benefit the financial position of their own societies, the Council of The Royal Photographic Society offers a special rebate of 10 per cent of the first year's subscription of each member of an affiliated society who joins the R.P.S.

The primary object of membership is to assist the Council in furthering the advancement of photography, but there are many privileges incidental to membership, including the receipt of a copy of this *Journal* immediately upon publication each month.

The Associateship and Fellowship will naturally interest those who have progressed in the art and science of photography. These coveted distinctions, and are accepted universally as evidence of genuine photographic ability.

The entrance fee of one guinea already waived to members of affiliated societies, and the amount of the rebate to the societies in which the new members belong will therefore be 10s. 6d. in each instance.

Secretaries of affiliated societies are invited to give their careful attention to this scheme and to co-operate in making it successful. The Secretary of The Royal Photographic Society will be glad to furnish further particulars and to furnish copies of the Society's prospectus, or to communicate direct with prospective members who will furnish their names and addresses.

THE PHOTOGRAPHIC JOURNAL

THE OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND
THE PHOTOGRAPHIC ALLIANCE

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FEBRUARY, 1943

TWO SHILLINGS
AND SIXPENCE



EBB TIDE

Manchester Amateur Photographic Society

ERNEST ALLEN



New York City

D. McMaster, F.R.P.S.

ROAMING AROUND

By D. McMaster, F.R.P.S.

At a joint meeting of The Royal Photographic Society and the Birmingham Photographic Society, held at the headquarters of the latter on November 21st, 1942, an illustrated lecture was given by Mr. D. McMaster, F.R.P.S., President of the "Royal," bearing the above title. The Chair was occupied by Mr. G. B. Mason, President of the B.P.S., who gave the lecturer a hearty welcome on behalf of his Society.

Mr. McMaster, on his part, said he brought a message of greeting and good fellowship from the Council and membership of the "Royal," and assured his audience of the friendship and sympathy of photographic organisations in his own country, America, towards their British comrades.

THE rolling stone gathers no moss. The wandering traveller, more often than not, builds no store of this world's goods to take care of him in old age. And, by the same token, the roaming photographer, whose itching finger has kept red hot the release trigger of innumerable shutters, produces, as a rule, no epic pictures. Certainly, this is true of this afternoon's speaker. The material things of life, generally speaking, mount up for the steady, hard-working, stay-at-home, who is willing to subjugate such adventurous spirit as he may possess and bend his every energy to the routine tasks. The great photographic pictorial

efforts are, again generally speaking, gained by those individuals who make relatively few prints, but a great deal of time and effort making.

But, just as there are intangible compensations for the traveller in the form of enriched backgrounds, poignant memories and of wide horizons, so too the roaming photographer may justly claim that he is not entirely cheated by the fact of his inability to create pieces of art. He has his many of many a pleasant contact through his photographic work and of many a friend gained through interchange of information and chat on photographic matters can throw on memory's screen hundreds of delightful scenes surveyed and studied before using them for his future work. Except in a few of those cases where the repressions on humanities were already considerable during the past decade, partly found the use of the camera the "sesame" to friendships. Time out of number I have been appreciated while taking "shots" which stalked myself, by uttering words who were anxious to share their own pet spots with me and direct me to other hunting grounds. Almost without exception the versions have been worth while and productive.

We hear much these days of the necessity for establishing an interchange of information in the different countries, about customs, habits, and modes of living.



Rural England

D. McMaster



own

D. McMaster, F.R.P.S.

and rightly so, that the more to know each other when times the less likelihood there of a repetition of this present. A great deal is written and about the uses to which radio put in the securing of inter-understanding. The power written Press is stressed and has been talk of the international of some of our papers. Too has been mentioned of the uses photograph and of the photo-in the cause of universal understanding and friendship. All has attention been drawn possibilities of using such as the cinematograph, the ed journals and the photo-clubs and exhibitions. What situation?

difficult to believe that many have so influenced certain of our lives as have the movies. Without question the d standards of living shown screen, which are purportedly to all phases of American re carried to those people re seemed to have been less an allure and an incen-raise their status. This has applied to clothes, modes of automobiles, etc., but has l to social conditions of all many cases the influences of movies could not have been of. In other cases, they have adoubtedly for the good. less, the influence has been d it is on this point that I

imilar way the newer illus-journals which are now so

popular are adding their influence to such older and more sedate illustrated periodicals as *The Illustrated London News*. Without question, periodicals of this type are conveying to the peoples in other lands the story of life as it is lived in this country and, of course, we are getting, through the same journals, a glimpse of life as carried on elsewhere.

All this is bound to increase with the tendency towards photographic printing, with the introduction of cheaper and better photo-mechanical methods and, of course, a little later

on, with the extended use of colour photography. In a slightly lesser way the illustrations in the daily newspapers will have a greater effect on the interchange of information as the use of pictures becomes greater. Almost instinctively one turns first to the illustrations in the morning newspaper. It is probably true that in those countries where there is a high proportion of illiterate or poorly educated people, the pictures represent a large share of the news which they receive from the papers. It is obvious that a wise use of photographs, and, in particular, of those intimate and interesting pictures taken by the casual traveller, would tend towards greater understanding amongst the nations.

At home here, too, the increased usage of the camera to depict interesting and pictorial "shots" will help to encourage and preserve all that is best in the cultural fields. Travelling by car recently from London to Oxford with a well-known American architect, the speaker many times paused to point out interesting pictures, design *motifs* made by farm-houses or farm lands, and pictorial lightings. A comment by this architect will be of interest. He stated that he has invariably found that those people who have an interest in art, in photography as a branch of art, are always the ones who in his company seem to get the most out of any trip. They are constantly on the alert for the pictorial, the beautiful, and whether or not they have the opportunity to stop and take the picture, they seem to have the faculty



Home in Skye

D. McMaster, F.R.P.S.



Matterhorn

D. McMaster, F.R.P.S.

of impressing these points of beauty on their minds. I agree most heartily with these observations of my friend the architect. It has been my own experience that pictorially minded people seem to get far more out of a journey than those whose senses have not been so developed.

There is much discussion these days everywhere about the future planning of cities and of towns and of highways. It seems to me that the roaming traveller-photographer who has had an opportunity of seeing and appreciating the best of architecture in many countries, and, most of all, of this country, must do everything possible to make certain that in the replanning we do not get so immersed in the new modern ideas that we neglect to use the beautiful types of architecture which have been so pleasing in the past. It would be the height of folly, I submit, to build cities of purely utilitarian design in brick and stone and concrete, beautifully lighted, splendid from a sanitary point of view, easy of access and with broad boulevards. Such a city or such a town might have no soul. It is entirely possible to combine with these plans something of the charm of British design of the past. Photographers can contribute greatly by using their influence in the avoidance of these solely utilitarian designs.

But perhaps the most interesting and most satisfying things that the roaming photographer picks up and retains are his memories and impressions of his photographic travels. Since it is about these impressions that I particularly wish to speak to

you to-day, I will now turn to the lantern slides which, much better than I can, talk for themselves.

Mr. McMaster then went on to discuss the lantern slides he had taken to Birmingham with him, commenting upon the impressions he had received of some of the different countries into which his travels had taken him. His first shots were of the United States, and varied from photographs taken from skyscrapers high over New York City and Chicago to backwoods scenes of upper New England. Successively his audience was taken then to the Basque country

of Spain, to Aragon and to Catalonia, thence through the Pyrenees to Perpignan, Carcassonne, and the blue waters of the Mediterranean. The slides showed points of view in Central France and along the Loire Valley, then to Normandy and Brittany. From here the slides led to sections of Switzerland and to the Austrian Tyrol, where a considerable variety of scenery was shown. It was evident that the speaker had a great bond of affection for the common people he encountered in the small Tyrolean villages. He described these villagers as independent and honest, as friendly and unaffected as they were hard working.

Some of the finest slides, as well as the most interesting, were from negatives taken in Germany. Stuttgart, the Black Forest, Rothenburg an Tauber, Nuremberg, Frankfurt and the upper Rhine were depicted, and a number of comments made upon the districts and upon the people of these sections. Holland was touched upon, and then Mr. McMaster jumped over to the Island of Skye, and to the Scottish Highlands. He thought it might be interesting to his audience to see the type of picture which was likely to appeal to the average trans-Atlantic visitor and to know of the impression often created by scenery and by the people. Dozens of slides were then shown of Wales, the Lake District, rural England and finally London itself. London, Mr. McMaster considered to be the most photogenic of all the capital cities he had ever visited. It had so many facets and so many changing moods that the ardent picture maker could indulge



Tyrolean Path

D. McMaster, F.R.P.S.



[Tyrol

D. McMaster, F.R.P.S.

at all times and in all
rs. Some of the slides ex-
showed scenes on the Em-
ment after heavy rain, some
fog, others in strong sunlight,
little known and seldom visited
and closes.

series of pictures showed life
e barge canals, and Mr.
ter told his audience that this
e type of subject likely to
great interest in visitors, since
ws were different from those
o be seen elsewhere. Generally
g, pictures taken should have
human interest tied in either
or indirectly.

ough the talk took only
over an hour, just under two
d slides were projected, and
quired great dexterity on the
f the lanternist, who came
this ordeal with flying

Thanks

lling upon Mr. W. A. Clark,
S., to move a vote of thanks to
Master, the Birmingham Presi-
pressed his appreciation of the
of both slides and discourse,
identally referred to the value
ure reports in the R.P.S.
The publication of one of his
tures had resulted in a wide
for its repetition from people
osely interested in the subject
e subsequent audience com-
over 700 people. He also
the hope that these joint meet-
uld form a permanent feature
ty life after this war was over.
Clark said he felt some degree

of doubt whether the lecturer could
possibly have made and processed all
the very beautiful slides they had
witnessed, but however that might be
he had shown himself possessed of no
little artistic ability even in the mere
selection of the various subjects
depicted, and the quality of their
technique was unsurpassed.

The vote was seconded by Mr.
Bernard Moore, who said he felt
specially glad to have this privilege
as one of the oldest members of both
Societies, and he too congratulated
the lecturer on the excellence of his

pictures. As Mr. Clark had said,
there was not a bad one among them.

The proposal was carried with
acclamation, and in his acknowledg-
ment, Mr. McMaster expressed the
fervent hope that when post war re-
building and planning was carried
out, there would be incorporated that
architectural beauty associated with
our ancient buildings, without which
future cities would become mere col-
lections of soulless bricks, mortar and
concrete. In regard to the slides, he
could assure Mr. Clark that they were
his own work entirely.

Coventry P.C. Diamond Jubilee

Coventry Photographic Club
celebrated its Diamond Jubilee by a
Dinner on January 6th. The follow-
ing extracts are from a report of the
function, which appeared in the
issue of the *Coventry Evening Standard*
dated January 7th.

"Mr. D. H. Lee-Bird, President of
the Coventry Club, replying to the
toast 'The Coventry Photographic
Club,' proposed by the President of
The Royal Photographic Society,
Mr. D. McMaster, reviewed the
history of the club, and thanked the
members for the manner in which
they had carried on in spite of war-
time restrictions.

Mr. G. B. Mason, President of the
Birmingham Photographic Society,
replying to the toast 'The Visitors,'
spoke of the important use of photo-
graphy in the reconstruction plans of
cities like Coventry.

Tribute was paid to the work for
the club of the oldest member, Mr.
A. W. Moore, who was unable to be
present."



Country Cottage

D. McMaster, F.R.P.S.



Wells Cathedral

PICTURE MAKING and WORTH-WHILE PHOTOGRAPHY

By Harold G. Grainger, F.R.P.S.

The first joint meeting of The Royal Photographic Society and the Bradford Photographic Society during the 1942-43 session was held on Saturday, 17th October, 1942, in the Mechanics' Institute, Bradford, when Mr. Harold G. Grainger, F.R.P.S., of Leeds, spoke on Picture Making and Worth-while Photography.

Mr. Scurrah, in introducing the speaker, remarked that Mr. Grainger was no stranger to Bradford, as he had given lectures or demonstrations on many occasions in the past. These had proved most interesting, and he felt that this afternoon's chat would be no exception.

AFTER expressing pleasure on being invited to give this lecture under the joint auspices of The Royal Photographic Society and Bradford Photographic Society, Mr. Grainger congratulated members on their success in the London Annual Exhibition.

Long experience amongst societies, he proceeded, led him to assume that most members have the ambition to produce prints meriting the term pictorial, but at first are often handicapped by inability to appreciate the meaning of such terms as chief interest, subordination of parts, accents, balance, etc. In the hope of overcoming this drawback, some of his almost seventy enlargements were displayed in pairs to demonstrate, by different arrangements of the same or

similar subject matter, some generally accepted picture-making principles, cognisance of which is helpful to good planning.

Defining good technique as the basis of worth-while photography, Mr. Grainger paid tribute to those who, by speeding up emulsions incorporating accurate colour sensitivity with fine grain, made miniature camera work possible. Yet materials, however good, do not deprive the ambitious of the inestimable advantage of control, and even the infusion of personality into their efforts.

Successful picture-making with a camera hinges on appropriate exposure and processing to secure essential co-ordination of negative and printing paper. "Finishing the Bust," for example, contrasty because of the



Left :
The Village Pump

Right :
Young Artists

Below :
"With many a curve
my banks I fret"

Curves and straight
lines in combination
suggest strength
with elegance.



In a similar manner comparable illustrations demonstrated the importance of auxiliaries of secondary value, usually introduced as compensation when the position for chief interest has been decided. Such additions, even if small, may by attraction not only counterpoise, e.g., the tiny boat in "Lowestoft Harbour," but exercise a great deal of control over the eventuating picture. Attention was also drawn to the value of knowledge of line direction, the exploitation of converging contours as guides to chief interest, and utilisation of the principles of radiation.

The fortuitous splash of sunshine in the vista, "Wells Cathedral," is not only pleasing in itself, but, additional to its value as a foil to this shadowed area, functions as an important directional line. Further illustrations of contour exploitation were shown in companion renderings of "A Miller's Meadow," where rough undergrowth was made doubly useful: (1) as dark-toned foreground interest for balance, and (2) directional contours guiding attention to the centre of interest—by selecting a viewpoint close to the ground.

Aerial perspective and its importance in outdoor work, particularly landscape, received attention, for it is undeniable that a correct tonal scale is essential where naturalism in rendering is the aim; in fact, it is a hallmark of worth-while photography. Repetition for the purpose of securing



emphasis was also dealt with. A cogent example is the portrayal of a "calm of evening" scene featuring a declining sun made more convincing where reflections of cloud forms in water are included. Another illustra-



tion of the principle was seen in "The Lure of the River."

Familiarity with line significance, which can be employed subconsciously, was also mentioned. Verticals, symbolising vigour and activity; horizontals, rest and passivity; curves, beauty and movement; and circles and ovals, without beginning or end, harmony, are all found in the realm of nature, as are examples of pyramidal and other forms emblemising stability. Amongst comparable exhibits demonstrating the correctness of those who prefer patterns combining curves and straight lines, which, suggestive of elegance and strength, are much more vital than arrangements embodying straight lines only, were a group of children at a village pump accompanying one comprising several girl artists. In the first-named the unrelieved angularity lacks, in comparison with its associate, the essential emotional appeal.

Such graceful directional contours are frequent in landscapes, especially of the type "With many a curve my banks I fret." Whilst the winding course of the rivulet is an obvious "line of beauty," attention was also directed to the sprouting of the slender branches from the curved parent trunk, which, in opposition as regards direction, assure to the tree (pictorially) a full measure of pattern stability. Just as useful is the contour of the extremities of branches of the nearer tree, which, rising until the



Above :
Richmond Castle

Left :
Leisured Gossipers

Right :
The Lure of the River

Repetition of pattern, tone, or theme is useful for ensuring emphasis





Two versions of
A Miller's Meadow

A good feature : Exploitation of contours as directional guide to chief interest

An adverse feature : Figure both unnecessary and inappropriate



highest point is immediately above the centre of the base of the trunk, adds to sturdiness of the pattern.

Limited to monochrome as the medium of expression, pictorialists must make the most of such resources as lighting and differential focussing. Diverse in themselves, both can be employed to secure such tonal contrasts as will promote emotional satisfaction. "Facing the light" (or almost so) effects are amongst the most beautiful nature offers; the least interesting, subjects illuminated from behind the camera.

Observant pictorialists frequently display preference for the longer shadows and softer lightings incident to early morning, late afternoon and early evening, when the beauty of plane recession is more pronounced. Transient effects of sunshine following rain, providing good scope for pictures in town and city, were also shown.

Several comparable exhibits featuring, respectively, uniform definition throughout and reservation of crisp focussing to the dominant interest, the rest of the subject being, according to location, more or less diffused, illustrated the value of differential focussing in landscape work. Lack of sharpness should not, however, mean loss of form, nor, by incongruity, attract attention.

Two renderings of "A Miller's Meadow" emphasised the necessity of appropriateness in figures associated with landscapes. Apart from the

size and position occupied, style and tone of apparel must be considered.

Rural workers are obviously natural as regards dress and occupation. Unless, however, subject matter is so meagre in content as to require some such addition to direct attention to a vital part of the composition, inclusion may still be unwise. In this instance, the town-dressed lady is obviously superfluous. Assuming her removal, a different trim would be necessary to obviate the disadvantage of a too central mill.

Modern, simple-style attire may, however, be compatible with a lovely

scene. The inclusion in "Afternoon in Arcady" (reproduced by courtesy of *Country Life*) of two small figures, one in shadow, the other edged with sunlight, is quite acceptable, because they are subservient to the landscape.

Discussing portraits and figures, the value of background simplicity was illustrated by two harbour scenes, in which the delicate tones of the setting for the more successful "Hauling Fish Ashore" showed clearly the action of the figures.

The monochrome rendering of colour and uses of filters were also discussed as well as the influence of tone and distance of subject from the camera on exposure; lens hoods; halation and its avoidance; functions of spot-lights, reflectors, diffusers and mirrors. A final exhibit, combining exposures from separate landscape and cloud negatives, included the simple mask employed. For such efforts the obligation of close observation of nature for ensuring essential harmony was stressed.

Concluding, Mr. Grainger said that ability to use pencil, brush or wad of cotton wool and colour is not necessarily justification for wholesale modification of tone values; ambition to secure naturalism should be accepted as a spur, not license to use tools alien to photographic practice.

An appreciative vote of thanks, proposed by Mr. C. E. Lawson, A.R.P.S., and seconded by Mr. E. B. Johnson, was carried with acclamation.



Above :
Afternoon in Arcady

Left :
Lowestoft Harbour

Right :
Hauling Fish Ashore

A cardinal principle :
Clear presentation of
leading features



CURSIONS with a CINE CAMERA

By F. G. Newmarch, F.R.P.S.

a meeting of The Royal Photographic Society, arranged jointly by the Colour Group and the Kinematograph Section, and held at 16, Prince's Gate, S.W.7, on December 5th, Mr. F. G. Newmarch, F.R.P.S., showed some 16 mm. filmsstrate a few "Excursions with a Cine Camera."

President, Mr. D. McMaster, F.R.P.S., was in the chair.

illustrations accompanying this report are reproduced from and-white enlargements from single frames 16 mm. Kodafilms by Mr. Newmarch.

NEWMARCH said that for nearly twenty years a cine camera had been an almost it companion on holidays and ons, and much of the pleasure erest of any trip would be lost

of self-produced moving pictures, and could claim to be amongst the first few enthusiasts in this country to take up this new form of cine photography.

The carrying of a quarter-plate Reflex as well as a cine camera presented an awkward problem until he invested in a so-called "miniature" camera which enabled him to be comfortably equipped for both "still" and "motion" pictures at the same time. He had tried out various cine cameras, and had worked with the three popular sizes of sub-standard film. His experiences caused him to decide on keeping to 16 mm. film. The "Magazine Cine-Kodak" commended itself to

him on account of its portability and compactness; it also gave the user the great advantage of being able to change readily from one type of film to another without having to finish the film already partly exposed in the camera. The films to be shown were all taken without the use of a tripod or fixed support for the camera, except for the titles.

Mr. Newmarch added that his photography was done purely for pleasure, and he obtained more enjoyment on his outings by dispensing with the burden of carrying a cine tripod. He liked to be prepared to record interesting incidents, on the spur of the moment, when the time required in setting up a tripod would mean losing the subject.

In the days of the handle-turned "Baby Pathé" he caused much surprise by being able

to obtain steady results without a fixed support for the camera. His device was in the form of a folding pocket triangle, which opened up with sides about fifteen inches long. Two angles of the triangle were supported on either shoulder, and the third he held in his left hand. The camera was fixed by ordinary tripod screw on the left-hand side at convenient eye position.

In this manner he was able to obtain good records under conditions when the erection of a tripod would have been impossible, such as when sea bathing.

Mr. Newmarch's first film illustrated excursions to a number of places of beauty and interest. He had the opportunity in the summer of 1939 to join a motor trip to Skye, commonly known as the misty Isle of Skye. He stayed at a farmhouse on Loch Isshort, amidst beautiful scenery thirteen miles from the nearest village and seven miles from the nearest road. The pictures included shots of the famous Coolins, and some farm scenes. In the summer time the daylight lasted to an extraordinary hour, and scenes taken after eleven o'clock at night were received with applause. Other Scottish scenery in the film included Glen Etive, the Caledonian Canal and Loch Lomond.

Some beautiful shots were taken in the Lake District at Rydal Water and other well-known spots. The film finished with a visit to Chessington Zoo, showing the amusement park, the flower gardens and the children's playground. The lily pond with its goldfish was well worth a visit, being one of the finest Mr. Newmarch had seen. A shot of interest to circus lovers was the procession of the Chessington circus artists, both human and animal.

Mr. Newmarch's second film was confined to shots at the London Zoo. He said it was a photographer's haven of refuge during war-time, there being



The Engine of the Chessington Model Railway

did not bring back with him al camera records of people aces visited. In his earlier raphic days he used to carry on holidays a quarter-plate with an accompanying bulky of plates, and when he saw, at esent day, so much beautiful one by small, highly efficient a cameras, he wondered at the asm and energy which enabled ice upon a time, to tramp long es with a cumbersome photo- equipment. Anyway, he had tification of knowing that his were rewarded with a satis- series of photographic re- many of which had been to the Society on past occa- and which covered rambles in countries, including Spain, Cor- geria, Tunisia and the Balkans. mportant epoch in the advance ography occurred about 1924, Kodaks introduced sub- rd reversible cine film. This at pened up a wonderful new field tography. He soon became nterested in the possibilities



Friar's Crag, Derwentwater

no photographic restrictions and plenty of interesting subjects for the camera. He spent many Saturday afternoons there during the war



Egyptian Sacred Ibis

years, and was always on the lookout for the unusual incidents among the

animals. Although many of the Zoo's inmates had been removed or had died during the war, there was still plenty to see and to photograph. The film had the charm of familiarity, the more so as it was in colour. There were some amusing shots of the penguins, a lovely picture of the peacock spreading his tail, and an animated hunt of a red admiral butterfly. The film finished with a record of the flower beds during the seasons of the year, showing the wall-flowers, tulips and flowering trees of the spring, and the brilliant summer display of dwarf dahlias, geraniums and verbenas, a cheering sight on a dull December afternoon.

Asked if he found it necessary to

have a fixed focus cine camera, or if he had a focussing camera, Mr. Newmarch said he always liked to have a focussing cine. A further question was the approximate distance at which he took the butterflies to which he replied from two to three feet with the standard one-inch lens.

The PRESIDENT proposed a very hearty vote of thanks to Mr. Newmarch for his pictures and his talk. The pictures demonstrated first-class composition. It was the easiest thing in the world to get fairly good moving pictures; it was a most difficult thing to get them with good composition and flair for the spectacular, all of which Mr. Newmarch had accomplished extremely well. The vote of thanks was accorded by acclamation.

THE PRESIDENT then called upon Mr. John Chear, a very old friend of the Society, to present his films and for an account of his methods.

MAKING THE MOST OF YOUR SUBJECT

By R. H. Alder

"WHAT is the subtle something which makes the difference between a record photograph and an exhibition print?"

This was the question put to the audience by Mr. Ralph H. Alder at the joint meeting of The Royal Photographic Society and the Preston Scientific Society, Photographic and Cine Section, on September 2nd, 1942, with Mr. E. S. Maynard, the chairman of the section, presiding.

Mr. Alder went on to answer his question.

"It is the same as that between 'programme' music and abstract music—the latter aims to convey emotion direct to the listener, while the former attempts to show a sequence of events.

"The photographer does not show the object which aroused the original emotion in himself; what he shows is a collection of static smudges in two dimensions which are conventional representations of three-dimensional objects, some of which were quivering with vivid life. He has to work within his conventions.

"In a way, every photographer adds to the conventions, as does every painter or musician. No one looking at the pointillist sketches of Paul Signac could deny the birth of a new convention, although he might decry it. But pointillist representation embodies an attempt to overcome one of the limitations of paint, just as the Hungarian school of photo-

graphers, with their brilliant glazed prints, try to overcome the limited tone-range of silver deposits on paper.

"Photography, indeed, has only begun to come into its own since it broke through the limitations which 'artistic' photographers imposed on it by trying to imitate the conventions of painting or etching. For it is only through a thorough adaptation of their proper materials and tools that photographers can reach out to a full expression of their feelings through their own conventions.

"That knowledge of materials and tools may be intuitive and instinctive in the photographer who has made hundreds of random experiments; indeed, instinct and intuition inspire all great works of art, so that there is a tendency to turn contemptuously from the intellectual, or critical, approach to art. But logical argument can reduce to a minimum the need for experiment; the study of past essays shows that, to gain a given effect, certain methods are bound to be unsuccessful, while others may prove promising. This, however, is the limit of purely intellectual progress in art. Technique is a handmaiden.

"Complete understanding is neither feeling nor knowledge: it is both in one. The great virtue of stringency of supplies is that it encourages the cultivating of understanding. By taking thought we learn to know our feelings, to see what provokes them

and what detracts from them; that is the technique of appreciation. We study the reactions of our materials and reason out what will emphasise tone-contrasts and what will suppress them; that is the technique of expression. A single exposure can then be the critical experiment to find out whether our appreciation and expression are successful.

"Such study is not immediately productive. But it leads to such control of power in the service of intuition as will bring a veritable renaissance when peace descends on us."

Mr. Alder's stimulating talk was followed by a discussion, after which, on the proposition of the chairman, a hearty vote of thanks to him was carried by acclamation.

Blitzed Libraries

In view of the fact that many societies have lost their libraries through enemy action, it is suggested that members who may be turning out unwanted volumes for salvage, should send any books on photography to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

These books would form a useful reservoir upon which the societies who have lost their libraries could draw.

Any books so forwarded would be accepted with very much appreciation.

EXHIBITIONS AT PRINCE'S GATE



Modern Manchester

Manchester Amateur Photographic Society

A. H. Green, F.R.P.S.



Anticipation

E. C. Sykes

EXHIBITIONS AT PRINCE'S GATE

Manchester Amateur Photographic Society Collection

THE collection of prints by members of the Manchester Amateur Photographic Society, which occupies the principal gallery this month, is, in a measure, unique in photographic exhibitions. Firstly, it purports to represent the best work done by the members during the past ten years, an unusual limitation in exhibitions of this kind, and, secondly, the work has been selected by a plebiscite vote of the Members of the Council from about five hundred sent in for the purpose. The Manchester Society has always been one of the leading photographic organisations in our country, both in numbers and in workers of distinction, and, as might be expected, the present collection, which is largely due to the enthusiastic labours of Mr. Charles Eshborn, their Exhibition Secretary, is fully worthy of their great traditions.

There is, of course, no hard and fast standard by which the beauty and significance of a picture can be measured. It is largely a matter of taste, of mental orientation and artistic training. Probably very few pictures would receive the same evaluation if assessed by a series of similarly-constituted juries at intervals of five or ten years. So the Manchester experiment, whilst interesting, is not one which I would whole-heartedly endorse. I have little actual knowledge of the personalities of the eighteen members of the Council who constituted the jury, and, therefore, cannot assess their competence individually to act in that capacity, but after comparing their votes with the pictures received I am not greatly

impressed with their collective wisdom. No doubt the method did rough justice to the works submitted, and the 120 selected did represent the cream of the hundred from which they were chosen. The fact that reviewing their first selection they found it necessary to replace several of those accepted by others which had been rejected means nothing. It is exactly our own experience at our Annual Exhibitions. It is easy to pick out the best of any collection of prints, but when you come down to the lower levels you are confronted by a mass of work of which it is almost impossible to say that any one is better than another. As I said, it is a matter of taste. On the other hand, and again it is a matter of taste, there are some that received major votes which I should not have rated so highly, and some which only just scraped in that were worthy of more consideration. Perhaps the most illuminating result was that of a picture which some years ago secured a prize of £4,000 in a world-wide competition (I shall not indicate it more precisely) which received only eight votes out of a possible eighteen, and I heartily concur with the jury's valuation.

There would appear to have been a remarkable lack of unanimity about the Council's voting. As I understand it, they were not being asked to vote which was the best picture, but to select 120 prints to represent the work of the Society. One would naturally suppose that they would be a considerable number of prints which would command a reasonably unanimous choice, but, in fact,

*The Skipper's Daughter*

O. Hood

only twenty-seven prints received the approbation of twelve or more of the eighteen voters, and seventy-one received between seven and ten votes. The rest received six votes or less, and no less than 112 received no vote at all. As I said, it is interesting, but most unconvincing, as a method of selection.

The accepted prints comprise eighty-one of a pictorial

character, seventeen natural history subjects, five record, three scientific, and four colour prints. In the first-named class it is pleasing to find three by the late James Shaw (Hon. Fellow), although they are not amongst his best work, and two of the late Travis Burton's (Fellow), whose architectural work was always of outstanding quality.

J. DUDLEY JOHNSTON.

THE COLLECTION

E. ALLEN

- "The Tree"
- "Ebbtide"
- "Pastorale"
- "The Harbour"

TRAVIS BURTON, F.R.P.S.

- "The Warrior's Tomb"
- "The Chapter House Stairs"

N. B. BUNT

- "Sand and Shadows"

C. W. BRADLEY, F.R.P.S., A.I.B.F.

- "Spring Song"
- "Lott's Cottage"
- Scientific Section—"Human Scalp $\times 150$ "
- Scientific Section—"Water Flea $\times 60$ "

R. H. E. BECKETT, A.R.P.S.

- "Dessert" (Colour Print)
- "Silver Shred" (Colour Print)
- "Gladioli" (Colour Print)
- "Iron Rations" (Colour Print)

J. D. BETTENCOURT

- "Good Companions"

T. H. BREAKELL, A.R.P.S.

- "Beauty and the Barge"

T. LONGWORTH COOPER

- "Adventurer"
- "Life"
- "Southwell Cathedral"
- "Design in Manchester"
- "Poise"
- "The Mainsheet"
- "Stove Pipes"
- "The Test Table"

JOHN CHAPMAN

- "Sunsplashed"

F. G. CURSON

- "The Scholar"
- "The Vagabond"
- "Chrysanthemums"

HARRY CHAPMAN

- "Underneath the Arches"
- "The Bristenstock"
- "The Sand Cart"

*The Sand Cart*

Harry Chapman

CHARLES ESHBORN, A.P.R.S.

"In Moreton Old Hall"

"The Spinning Maid"

"Silver Lining"

Record Section—"In the Main Gallery of a Coal Mine"

Record Section—"Roman Road, Blackstone Edge"

C. N. FENTON, A.R.P.S.

"A Samlesbury Interior"

B. R. FISHWICK

"Meditation"

"Across the Plain"

"Modern Interior"

H. H. FINDLOW, A.R.P.S.

"Reynard"

"Blue Tits"

R. G. FENNAH, A.R.P.S.

"Daddy's Girl"

"Collector's Pieces"

"Chinchilla Cat"

"Old Pewter"

"Vulgate"

Natural History Section—"Polar Bear"

A. H. GREEN, F.R.P.S.

"Industry"

"Modern Manchester"

"Journey's End"

Record Section—Shakespeare Memorial Theatre

Floodlit"

B. GARTH

"Portrait of a Pig"

"T'ould Cobbler"

"In Profile"

"The Weir"

Natural History Section—"Eagle Owl"

Natural History Section—"Curlew Approaching Nest"

W. GREGORY

"Pulling the Boat In"

J. H. HANKEY

"At Polperro"

O. HOOD

"The Skipper's Daughter"

"Cashing Up"

H. H. HOUGHTON, A.R.P.S.

"Summer Breezes"

"Snowtime, Alderley Edge"

W. E. HUGHES, F.R.P.S.

"A Street Corner in Jerusalem"

ANNE JACKSON, F.R.P.S.

"Study in Lace"

"Invitation"

"Sonning Cottages"

"Just a Teeny-weeny One"

"In the Path of the South-West Wind"

"A Modern Lancashire Collier"

Natural History Section—"Copulation of Agn

Puella"

Natural History Section—"Two Studies of the Cran

Fly"

G. B. KEAREY, F.R.P.S., F.I.B.P.

"Winter Birches"

"The Road to Lettoch"

"Choir, Manchester Cathedral"

"Rebhoan Bothy"

"The Font, Kirby Malsam"

Natural History Section—"The Grey Hare"

Natural History Section—"Study of Capercaillie"

*Spring Song*

C. W. Bradley, F.R.P.S.

Natural History Section—"Scottish Red Deer in Velvet"

Natural History Section—"Jackdaw at Carrion"

Natural History Section—"Magpie with Food"

Natural History Section—"Polar Bear"

Natural History Section—"Blackberry (Common Bramble)"

Natural History Section—"Greenshanks"

JOHN LOMAX, A.R.P.S.

"The Two Pillars"

"Cellarium, Fountain Abbey"

"Sun and Shadows"

ALICE M. MITCHELL

Record Section—"The Happy Housewife"

HILDA MARSDEN, A.R.P.S., A.I.B.P.

"Stokesay Castle"

"Curves in Steel"

"Over the Conway"

Natural History Section—"Monkeys, Belle Vue"

Record Section—"Canterbury, Choir"

RALPH J. B. MARSDEN

"Staircase, De La Warr Pavilion, Bexhill"

C. D. MILNER

"Welsh Springtime"

A. P. MORRIS

"Reeds"

Natural History Section—"Pearl Bordered"

CHAS. W. POWELL

"Informal Portrait" (Winner of £4,000 Prize)

DAISY SNODDY, F.R.P.S.

"Sunshine and Squalor"

"A Bit of Asconia"

"Sunshine in Losone"

"Scene Pittoresque"

"The Plotters"

W. STEPHENSON, F.R.P.S.

Natural History Section—"Kittiwake"

E. C. SYKES

"Anticipation"

"Tapestry"

JAMES SHAW, HON. F.R.P.S., F.R.S.A.

"Mosque Pool"

"Evening Light, Polperro"

"The Camp, Morocco"

"The Donkey's Serenade"

STUART G. SMITH

Natural History Section—"Scottish Crested Tit"

Natural History Section—"Yellow Wagtail"

F. B. D. THORPE

Natural History Section—"Tufted Duck Sitting"

COLIN J. UNSWORTH, F.R.P.S.

"Arabesque"

"The Hidden Valley"

"Veiled Shadows"

S. WYATT

"Hard Times"

EXHIBITIONS AT PRINCE'S GATE



The Spinning Maid

Manchester Amateur Photographic Society

Charles Eshborn, A.R.P.S.

THE THIRTEENTH HURTER AND DRIFFIELD MEMORIAL LECTURE

THE thirteenth Hurter and Driffield Memorial Lecture was delivered on Saturday, November 28th, 1942, at the Society's House, 16, Prince's Gate, S.W.7, by Dr. S. O. Rawling, F.R.P.S., who chose for his title, "Sensitometry Since Hurter and Driffield." Dr. H. Baines, Vice-President, was in the chair.

The Chairman, in introducing the lecturer, said that these lectures were designed to keep green the memory of those pioneers of scientific photography, Hurter and Driffield. The science of sensitometry was founded on their classical researches, and it was very appropriate that Dr. Rawling should have chosen this for his subject. It was one on which he had specialised knowledge, and to which he had contributed important papers. He had a peculiar aptitude for summarizing knowledge, and the years had been strewn with most valuable abstracts of scientific photographic subjects from his pen. The meeting was very privileged to hear another such summary from him that day.

The memorial lecturers had been men who were prominent in scientific photography, and it was for that reason that Dr. Rawling had been invited to give the thirteenth lecture. Like the curves which he would no doubt describe, he had many characteristics, one of which was perhaps of more intrinsic value than his scientific eminence—that was the way in which he endeared himself to everyone with whom he came into contact. There was no one in the scientific photographic world who was regarded with more widespread and genuine affection than Dr. Rawling, and it was a great privilege to be in the chair on this occasion.

Dr. Rawling then delivered the lecture.

SENSITOMETRY SINCE HURTER AND DRIFFIELD

By S. O. Rawling, D.Sc., F.R.P.S.

THE best memorial to Hurter and Driffield is the continued application of their teaching by the photographic industry. The basis of photographic sensitometry is a characteristic curve of the material under test, and when we remember that the particular characteristic curve in use to-day is still known as the "H & D curve", obtained by plotting density against logarithm of the exposure, we realise the excellence of work which was done so long ago by these two scientific amateurs whose names we are once more bringing to-day. The principle of sensitometry remains the same; the values of the co-ordinates of the curve have been corrected and brought nearer to standardisation; new apparatus has been applied to the work, and results themselves are interpreted in new ways which make it possible to link sensitometry much more closely with practical photography. I propose this afternoon to sketch in outline some of these details; to show some of the ways in which the H & D curve has been pulled into line in order the better to guide those who use photography and those who must provide the best kind of photographic material for each particular purpose. It is almost fifty-three years since Hurter and Driffield showed what was probably the most important of their results (1). This was entitled "Photochemical Investigation and a new method of determination of the sensitivity of Photographic Plates," and was published in the *Journal of the Society of Chemical Industry* on May 31st,

In this paper they described shortly the "laws of absorption of light by opaque black substances," and defined the meaning which they attached to the terms opacity, transparency and density of a negative. They stated their opinion that "a negative is theoretically perfect when the amount of light transmitted through its various gradations is in inverse ratio to that which the corresponding parts of the original subject sent out." They described a photometer for measuring density and went on to report on the behaviour of photographic plates, using this instrument for measuring the response of the plates to exposure and development. The general shape of characteristic curves was demonstrated and from this they put forward their doctrine of how to obtain negatives which by their definition should be perfect. Lastly, they described a method of calculating photographic speed values from characteristic curves.

My argument will be found to arrange itself quite naturally about the H & D curve. To begin with the density axis, there came early difficulty. The first note of "trouble" was sounded in 1891 by Hurter and Driffield themselves in a paper (2) on the "Relation between Negatives and their Positives." Using density values determined on their own photometer they found that the effects of exposure to light behind the negatives were greater than those calculated directly from the densities as measured.

They supposed that this was caused by light reflected from the surface of the printing material and that part of this light was then reflected back again by the negative

the 1990s, the number of people in the United States who are obese has increased by 100 percent. In the United Kingdom, the number of obese people has increased by 50 percent. In the United States, the number of obese people has increased by 100 percent. In the United Kingdom, the number of obese people has increased by 50 percent. In the United States, the number of obese people has increased by 100 percent.

1	0.22
1	0.07
1	0.42
1	4.83
1	4.73

where σ_{max} is the maximum stress of negative materials and σ_{min} is the minimum stress of the value of Q , the first material is giving the higher values of Q . The second material is giving the lower values of Q . The value of Q is given by the equation (1) The value of variation of Q is given by the equation (2).

	Q	LO
Wright	1.54	0.65
...	1.68	0.80
...	1.87	0.54
...	1.22	0.82
m	1.0	1.0
...	1.0	1.0

It is evident that the values of the reciprocals of Q values shown in the third column of Table 2 cover a range of values very similar to that quoted by Hurter and Driffield for their factor r described nearly twenty years before. This serves as an example of the fact demonstrated

4. In Chapman Jones in 1898 and suspected by Abney in 1891–5, that light scatter was the major influence causing the discrepancies between printing densities and H & P measured densities.

The winter of 1924-5 found our Society busily preparing for the Sixth International Congress of Photography. Standardisation of photometric methods was the topic of the times. The object was to specify technique so that results obtained in one laboratory might be repeated exactly in another.

The programme of the Scientific and Technical Group of the Society for that session was largely taken up with discussion on various aspects of the subject. Concerning the standardisation of density measurements, Toy proposed that the standard density of a negative should be determined in terms of contact printing density. Thus:

For a fixed length of a negative it is the common logarithm of the intensity of the printing which will produce the same density as a contact with a printing having the same intensity as unit intensity and for a fixed length of exposure for the same time of exposure and for the same development.

It is noted that on several negative materials the printed density values were proportional and very nearly equal to the density as determined on a contact opal densitometer, and suggested that contact opal

[illegible]

Other kind of photomaster, for now, and which may have been of interest throughout the period under review, for increasing a negative or positive contact printing density, it has been customary to use an opal diffuser in contact with the negative and to measure the change in brightness of the opal caused by removing the negative. The reason for the introduction of the arrangement of negative and printing paper of reflective, if not also, the brightness of the opal to be proportional to the total amount of light transmitted by the negative and which would then be a candidate for building up the positive image in contact printing. The reason, first, if the opal is a perfect diffuser, B, putting an opal in contact with the negative, the total amount of light reaching the screen is very much reduced, but a certain period of light scattered by the negative is now built up further so that each line ends off a proportional contribution to the observer. If the opal is not a perfect diffuser, the amount of each of the two contributions is B and the observer sees it, therefore higher than it should be. During contact opal densification, reverse the order of opal and negative, the opal being placed through the negative. In such an arrangement the function of the opal is to prevent completely scattered light to the negative. The negative itself will, of course, change the direction of one ray of light which would have reached the observer so that they will be lost, but

will change the direction of the ray, the same number of rays will be reflected back, and will add them to the other rays and balance exactly the first mentioned group. The result obtained by either a movement of mirrors, and speed presented the opposite of a very good difference may be expected to be very small. The same rule is pertinent to the heat and electricity, their difference may be not so small.

A well known example of contact potential density meter was the Schmidt and Huenichen radiation photo-

meters should be calibrated in terms of printing. At the meeting of the Congress (7) which followed these proposals were, however, not adopted. It is noted that a negative had been exchanged between the principal sensitometric laboratories throughout the world; density values obtained for it had agreed sufficiently (the maximum difference quoted was 0.03): also said that all negatives would not give the same results relating the values obtained on an opal densitometer to printing densities.

Congress resolved that "*The densities of negatives measured visually in diffuse light.*" The method adopted for the measurements was referred to the permanent executive committee of the International Association of Photography—and the measurement of density is still not standardised.

The story about density does not end at this point, however. Even before the events which I have just related, Bull and Cartwright (8) had carried out experiments in which an integrating sphere photometer was used for measuring all the light transmitted by a negative, and they claimed that this instrument would, therefore, give true contact printing densities. This idea has now been brought forward once more by Tuttle and Cartwright (9), who claim for the integrating sphere photometer the advantage already claimed by Bull and Cartwright, and further state that the specification of an integrating sphere photometer is very simple. They propose, therefore, that it should be used as the standard of reference for the calibration of contact opal densitometers.

Toy's suggestion to consider as of zero density any support does not appear to have been followed by Cartwright and Tuttle, though it seems likely from a statement by Davies and Owen (10) that this might lead to simplification.

In measuring effective densities for all the ways in which negatives are used we must remember the sentence which I have already quoted: "density, however expressed, will need different corrections for different circumstances." If this rule is obeyed it will be possible to find true values of effective density even in such circumstances as are brought about when printing coloured negatives or when projecting the image of a photographic deposit.

As far as we have seen the progress which has been made towards stating more precisely the units on the density scale of the graph. The period has, however, been remarkable for the great improvement in the means of finding density values. Not least among these improvements has been the application of the optical wedge to photometry. The wedge is a screen of absorbing material increasing in thickness arithmetically from one end to the other. The optical density of the screen, being proportional to the thickness, also increases arithmetically. Goldberger (11) applied this device to densitometers by using the brightness of the comparison beam, and so was able to make use of the arithmetic growth of density with length by coupling the wedge to a writing mechanism mounted over a graph paper. In this way the process of reading a scale and writing down the result was reduced to a simple mechanical operation of the writing mechanism. The principle has been very widely used in most laboratories in which many characteristics are plotted. The Goldberger Densograph is probably the simplest example of its kind, but it has been used in many other instruments, of which the A. photo-electric densitometer (12) devised by Toy is known in this country.

One of the photo-electric densitometers introduced is the improvement made by substituting photocells for human eyes in this work, but that is a story concerning ways and means, and does not

belong properly to the present subject. It has, of course, made possible a very great expansion of the application of sensitometry, but this has come mainly because of the increased ease of measurement and recording.

We must turn next to the abscissa of the characteristic curve. This scale is divided in terms of the logarithm of the product of illumination and time, and has received a very great amount of study.

Hurter and Driffield used a candle flame as the source of light for their experiments. This had a number of disadvantages: it was weak generally, and it was weak particularly in blue light to which photographic materials even in these days of panchromatism owe a great part of their sensitivity. Other workers favoured burning magnesium. This yielded a light of much higher intensity generally, and contained a higher proportion of blue light. The inconveniences of using this light source were, however, very great. It was, because of the white magnesium oxide smoke, even more messy than the candle; it could not be used as a steady source of light, and exposures were, therefore, difficult to assess in terms of candle meter seconds, so that the exposure was necessarily expressed in some such terms as milligrams of magnesium at a given distance. Another source employed for a time was the acetylene flame, but this also was not very convenient, and it is not surprising that electric, hot filament, lamps should have supplanted all the older sources for sensitometry. They provided controllable, steady sources of higher candle power than had been available previously. At first they were calibrated for "photographic candle power" against standard candles using photographic methods of photometry. Since photographic materials embrace a very wide range of different types of colour sensitivity, this kind of calibration was soon found to be unsatisfactory, because though two lamps might be found to have equal power when calibrated by means of ordinary blue sensitive materials, they might show quite different powers when calibrated by means of panchromatic materials. Similar energy distribution in all the standard lamps was necessary, and we shall now see how this completion of the standardisation of lamps has been achieved.

The Sixth and Seventh International Congresses of Photography were the scenes of great argument about the standardisation of the light source. By this time, 1925-1928, the principal standardising laboratories of the world were well advanced in specifying the quality of light emitted by a hot body such as the glowing filament of an electric lamp. This was done in terms of the apparent temperature of the filament, and lamps were calibrated so as to match the colour of the general light emitted at a known temperature from a glowing cavity known as a standard black body radiator (13). Thus we have the term "colour temperature" used to specify the quality of light from electric incandescent lamps.

The commonly used substandard, vacuum lamp of the photometry laboratories is capable of working well at a colour temperature of 2360° on the Kelvin scale of temperature, and it was finally decided that such a lamp should be adopted as part of the standard light source for photography. The choice of 2360°K appears to have followed from the fact that this was supposed to be the colour temperature of the acetylene flame which had by that time been used with a correcting filter to imitate sunlight.

The 2360°K light was, however, not adopted as a complete standard. It was capable of much higher output than the candle, and it was relatively richer in blue light, but by this time photographic technicians craved for a more evenly balanced distribution of energy such as occurs in direct sunlight. The improvement demanded was not to be gained without sacrifice. It was thought

inadvisable to use as standards glowing filaments at much higher temperatures than 2360°K , and it certainly is not possible to run a filament at a colour temperature of about 5000°K ; the material of the filament would melt or volatilise long before such a temperature could be reached. Thus it is necessary to filter out the excess of green and red light. The experience of the standardising laboratories was again used in selecting the suitable filter, and after a considerable amount of argument the choice was made from a large series of filters devised and specified by Davis and Gibson (14) of the American Bureau of Standards. This filter converts light from a colour temperature of 2360°K to the approximate quality of mean noon sunlight at Washington. Thus we are in possession of the specification of a standard light source which can be realised very easily in the laboratory, which gives a fairly even distribution of energy over the most of visible part of the spectrum, and which satisfies those who cry for "artificial sunlight." In passing, it may be noted that the extreme variations in the quality of real daylight are probably almost as great as between ordinary electric light and mean noon sunlight. For example, the light from clear blue sky is almost as weak in red as the electric light is weak in blue. Nevertheless, the compromise adopted for laboratory work must be considered as a very reasonable one.

Recently there has been found a need for light sources of very much higher power. The substandard photometric lamps are vacuum lamps and cannot be run at temperatures much above 2360°K , and their total candle power is in the neighbourhood of 30. The discovery of the effect of enclosing an inert gas in the bulb of the electric lamp, and the resulting invention of the gas-filled lamp, has provided lamps which can be run for long periods at a temperature of about 2850°K , without much change in output. It is quite common to develop several hundred candle power in a single small lamp of this kind, and there is available another Davis and Gibson filter which converts 2848°K (say, 2850°K) to mean noon sunlight. This filter, since it has not such a wide gap of colour temperature to bridge, has a considerably higher transmission; thus the resulting laboratory sample of mean noon sunlight is of far higher available candle power than that of the 2360°K source with its appropriate filter. This is illustrated in Table 3, which shows data for two sources in actual use.

duces the question of which of the factors is to be in giving the series of test exposures necessary for mining the characteristic curve of the material and Hurter and Driffeld, probably for convenience, time, keeping intensity constant; we now call "time scale" method. They assumed that the would have been the same if time had been kept constant and the intensity had been varied. But reciprocity of time and intensity does not always produce equivalent photographic results. In pictorial photography the varying tones in a given negative are produced by exposure for the same time (determined shutter) to a series of intensities determined by the mass of the various parts of the image in the camera seems, therefore, that the ideal system would be to intensity scale in sensitometry. This however is said than done. On the other hand, time scale meters are easy to specify, and can be constructed with great precision. They have accordingly found favour in certain applications; for example, they are admirable in providing a scale of exposures for the negatives employed for checking the performance of developers and developing machines; they are excellent for checking the uniformity of production of photographic materials. Their main limitation is that they do not give reliable information about the presence of different materials in the camera. They have therefore been in studying the behaviour of different materials in practice to use, so far as possible, in scale sensitometers at times of exposure comparable to those employed in the camera.

There are two main difficulties in devising a scale meter to work on the intensity scale principle. The first of these is the enormous waste of light in providing a scale of intensity. The unmodulated light must be of high power in order that the lowest intensity of the scale be adequate. It is not uncommon for the last sample exposed in a sensitometer of this type to be less than one-thousandth part of the light received first. The second difficulty is that of providing means for varying the intensity over a sufficient range without introducing some change in the quality of the light. The common way of referring to this is to say that it is difficult to make a neutral intensity modulator. The common gelatin wedges devised by Goldberg were made of materials as india ink mixed with bluish dyes to

Table 3

Lamp	Candle Power	Filter	Filter transmission	Resultant Candle Power
Tungsten Vacuum Lamp (30 watts) photometric substandard at 2360°K	23.5	2360°K to M.N.S.	0.135	3.2
Gas-filled Projector Lamp (250 watts) at 2850°K	395	2848°K to M.N.S.	0.262	103

There is a slight difference between the qualities of these two light sources, the more powerful having a slightly higher proportion of violet light. The difference is, however, known precisely, and its effect on sensitometric results can be evaluated.

The establishment of a standard light source has been one of the most valuable results of all the efforts which have been made towards standardisation of sensitometric methods. It is, however, far from being the only factor controlling the absolute values of the characteristic curve, exposure being a product of time and intensity, intro-

duces the question of which of the factors is to be in giving the series of test exposures necessary for mining the characteristic curve of the material and Hurter and Driffeld, probably for convenience, time, keeping intensity constant; we now call "time scale" method. They assumed that the would have been the same if time had been kept constant and the intensity had been varied. But reciprocity of time and intensity does not always produce equivalent photographic results. In pictorial photography the varying tones in a given negative are produced by exposure for the same time (determined shutter) to a series of intensities determined by the mass of the various parts of the image in the camera seems, therefore, that the ideal system would be to intensity scale in sensitometry. This however is said than done. On the other hand, time scale meters are easy to specify, and can be constructed with great precision. They have accordingly found favour in certain applications; for example, they are admirable in providing a scale of exposures for the negatives employed for checking the performance of developers and developing machines; they are excellent for checking the uniformity of production of photographic materials. Their main limitation is that they do not give reliable information about the presence of different materials in the camera. They have therefore been in studying the behaviour of different materials in practice to use, so far as possible, in scale sensitometers at times of exposure comparable to those employed in the camera.

and then developing them. Such wedges are sufficiently neutral for ordinary sensitometry. Difficulties are not so serious if only a short scale of s is required. In 1931 the German committee for Photographic Research put forward a specification for a sensitometer using an intensity scale. It was, to be used for establishing only the foot of the characteristic curve at an exposure time of $1/20$ th of a second. Thus it did not require a very long scale of s . It was later incorporated in the famous DIN specification for measuring the speed of a negative in terms of the amount of light to produce a density of 0.1 above fog. This sensitometer employs as its specification simply states that the wedge is neutral, without calling attention to any difficulty in providing such an admirable piece of apparatus. We now come to the interpretation of results of photometric measurements. Hurter and Driffield define photographic speed of a negative material in terms of the minimum exposure necessary to record the lack of a scene on the lower extremity of the characteristic curve of the negative. It is true that the graphical method of determining speed necessitates the inclusion of a little of the foot of the characteristic curve where the slope is changing and is that of the straight line, but with the negative which they favoured the amount of the foot so small, and we must admit that these negatives were formed very closely to their definition of a perfect negative. We ignore, as they did, the distortion of tone in the image by scattered light within the lens.

A conclusion which has been drawn from the theory of tone reproduction is that, for true tone reproduction in a print made from a negative, the product of the slopes of the negative curve and positive curve should be unity. In making prints on paper it is, more often than not, necessary to use almost the whole tone range of the paper. To get clear white to a density approaching the black possible. Thus the whole of the characteristic curve of the paper comes into play, and since this is "curved" and not a straight line for the whole of its course a complication of the H & D doctrine to obtain a perfect print, the angle of slope of the negative curve must be complementary to the corresponding part of the paper curve. The tones of the scene correspond with the darkest part of the negative and with the lightest parts of the print recorded on the least sloping part of the characteristic curve of the paper. The negative record of this scene should therefore be on the most steeply sloping parts of the negative curve. At the other end of the density scale of the scene the deepest shadows are near the deepest black of the paper where the slope of the paper curve is greatest. This part of the scene is recorded at a lower density region of the negative. It follows that the slope of this part ought to be the same as that of that part of the curve corresponding with the black of the paper. Thus the negative should include part of the foot of the curve. Hurter and Driffield called the under-exposure region the under-exposure curve.

The problem is to decide how much of the lower part of the negative curve should be included. As an experiment let us try whether the question may be decided by selecting as a limit that point on the negative curve where the angle of slope is the exact complement of the angle of slope of the paper curve in the region which is to be reproduced in the shadows of the scene. With a very large present-day printing paper the region of the characteristic curve used for the greater part of the scene is that of maximum slope, and this is generally achieved, at any rate, directly with the contrast-

giving power of the paper. By using the "hardest" printing paper available it will be possible to creep down a very long way into the foot of the negative curve and still obtain true tone reproduction in the deep shadow regions of the print. Meanwhile, however, what has happened to the remainder of the tone scale? The choice of the hardest available printing paper will bring with it the difficulty that the whole tone scale of the paper will be brought into action by a very small density range in the negative and our print, while recording the deepest shadows with accuracy will exaggerate the middle tone differences and will record all the highlights as blank white paper. Thus the limit of our creep down the negative curve in search of speed must be set not only by the conditions necessary for reproducing shadow detail, but by the total density range of the negative. The latter is the main factor which determines the contrast grade of the paper which must be used in printing, a fact very well understood by Hurter and Driffield themselves. The contrast grade of a printing paper may indeed be fairly accurately expressed in terms of the negative density range which it will accommodate (15).

The slope of the curve of the printing paper must therefore depend on the density range of the negative from which the print is to be made. The smaller the density range of the negative, the greater must be the slope of the paper curve and vice versa. Our first attempt at deciding how far we may creep into the "under-exposure" region of the curve has thus failed, unless we first choose a printing paper of the correct exposure range (correct contrast grade) for the negative concerned.

Photographic "speed" of a negative material thus appears to depend not only on the power to record shadow detail, but also on the density range produced in the negative by the whole scene, that is to say, upon the contrast of the negative as a whole.

There is, however, still another reason for creeping into the foot of the characteristic curve. I shall now attempt to explain in my own way a recent series of experiments by L. A. Jones (16) dealing with this relation. As a rule, the main pictorial interest of a photograph does not lie in the extremes of the tone range but somewhere near the middle, and we are generally satisfied with a print in which extreme shadows are lacking in a little of their detail. That is to say, instead of insisting on perfect tone reproduction in the shadows we can there accept some compression of the tone scale, and the product of the slopes of the negative and positive curves can be less than unity. The general condition that the density range of the negative must suit the contrast grade of the paper must still be observed, and we may argue our problem as follows by assuming for the sake of simplicity that the characteristic curve of our selected correct printing paper is a straight line joining two points which on the abscissa scale (log. exposure) differ by an amount equal to the density range of the negative and on the ordinate (density) scale differ by an amount equal to the maximum black of the paper (Fig. 1).

Let K be the permissible tone compression factor for the shadows. Then the limiting point of the negative curve will be given by

$$G_n \cdot G_p = K$$

where G_n is the gradient of the negative curve at the limiting point and G_p is the gradient of the positive curve, so that

$$G_p = \frac{D_{\max}}{D_n}$$

where D_{\max} is the maximum density of the selected printing paper and D_n is the density range of the negative.

Substituting this value of G_p in our first equation, we have

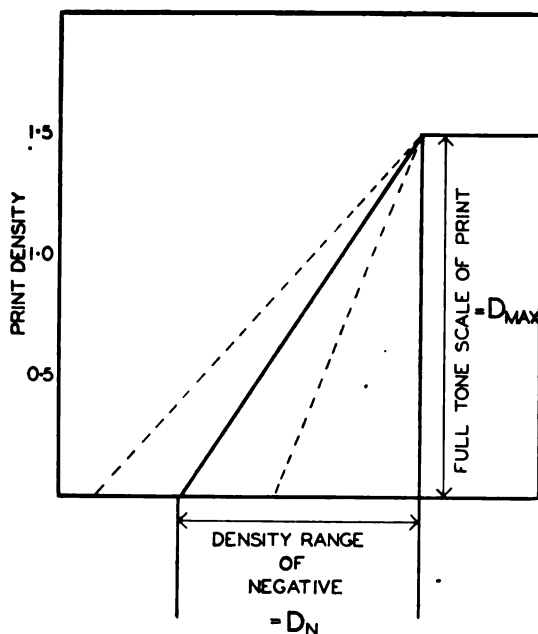


Figure 1. The dotted lines represent characteristic curves of printing papers which are unsuitable for the negative. The full sloping line represents the characteristic curve of the printing paper having a contrast grade suitable for the negative

$$G_n = K \frac{1}{G_p} = K \frac{D_n}{D_{max}}$$

Now D_{max} , while it is certainly different for different papers, does not vary very widely, and is of about the same order of magnitude as the log. brightness range of an "average landscape," a circumstance which enables us to give a further meaning to the algebraic formula just derived, because for D_{max} we can substitute $\log. B$, where B is the brightness range of an average subject requiring the full tone scale of the printing paper for its portrayal, so that

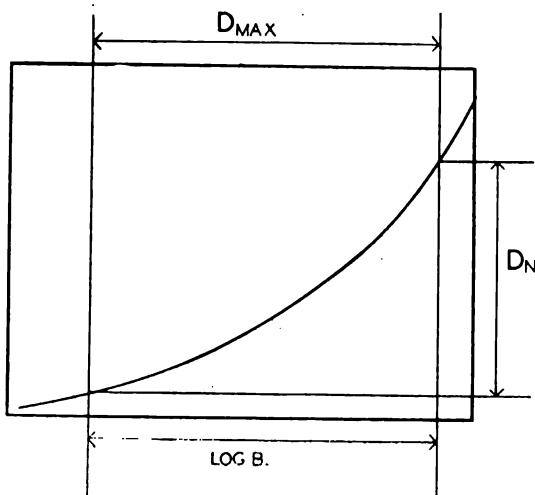


Figure 2

$$G_n = K \frac{D_n}{\log. B}$$

and from Fig. 2 we see that $\frac{D_n}{\log. B}$ is the average

slope of that portion of the negative characteristic curve which is used to satisfy the conditions which we set before us.

Here then is the mathematical expression for a possible definition of photographic speed for negative materials which would be used for ordinary pictorial work on subjects of average brightness range. It may be objected that the assumption of a straight line for the characteristic curve of the selected photographic paper is far too sweeping, and in reply I can only say that in practice the curve of the printing paper will not be straight, and accordingly the available slope for shadow reproduction will be higher than has been assumed and the approximation of truthful reproduction of tone will be somewhat better; the application of the rule should however give a reasonably good estimate of the minimum negative exposure which will yield a satisfactory print on a paper selected to suit the density range of the negative.

To proceed: It seems that a reasonable value to take for $\log. B$ would be about 1.5, and we have only to select a value for K , the permissible degree of tone distortion in the shadows. Jones, in a monumental experimental test of the formula, has decided that 0.3 is a reasonable value for K , so that the limiting point on the negative characteristic curve occurs where the slope

$$G_n = 0.3 \frac{D_n}{1.5}$$

The term $\frac{D_n}{1.5}$ has been altered to \bar{G} , where \bar{G} is the average gradient of the negative curve over the part considered. The final form of the expression is thus

$$G_n = 0.3 \bar{G}$$

This is an expression of the *Fractional Gradient Criterion of Speed*.

Jones has tested this formula by a statistical method. He prepared a number of transparencies of landscapes to serve as laboratory originals for his experiments. His use of one of these transparencies will serve to explain his method. A series of negatives having progressive increase of exposure was made upon each of a number of negative materials. From each negative the best possible print was made, using for each the most suitable available grade of printing paper. Thus for each negative a series of prints was obtained. The quality of these prints varied from quite unacceptable through just acceptable to excellent. Jones employed a group of about 200 observers to answer the question: Which, in the series of prints arranged in order of increasing negative exposure, was the first one which could be called excellent? The majority vote was taken for each series, and so the minimum camera exposure necessary to yield the first excellent print was established for each negative material. This was eventually done for more than seventy negative materials and for several scenes and made it possible to establish the relative working speeds of the materials as judged on pictorial results by the average observer. These results were then used as the established yard-stick with which sensitometric determinations of speed could be compared.

The comparison between the statistical practical estimate of speed as determined by the selection of the first excellent print and the speed as measured by the fractional gradient method gave a total spread of 0.17 on the logarithmic scale. That is to say, taking the extremes,

most of all a governable that "shuts immediately you not one that dragged to open dragged to shut. If he had to put h dragging at all, he would a shutter with a dragged open- ther than a dragged closing. case of children this quickness ecially necessary, because of elihood of movement of the all the time. Indeed, he said he could not draw a child's e would have to discard the part of his work.

of Thanks

Adams's brief talk was ed" by the handing round of a number of child portraits (in country homes), which were admired, and on the proposi- the CHAIRMAN a hearty vote ks was conveyed to him for an ining and instructive evening.

of these prints are here aced.



The Grandson



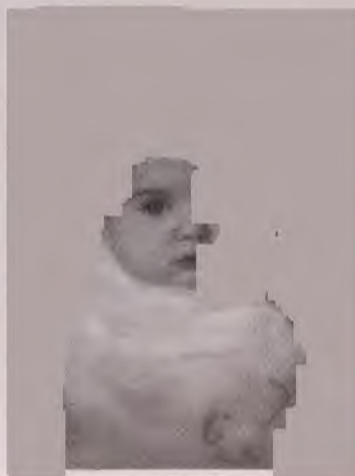
At the Piano



The Newcastle Portrait



Boy with Rabbit



Ready for Bath

The *Photo Lab.* Index suggests the following:

Diethyl-p-phenylenediamine hydrochloride	18 grams.
Sodium carbonate	40 grams.
Potassium bromide	1.0 grams.
Water to make	1000 c.c.s.

(NOTE.— See also "Making Colour Prints," by J. H. Coote, F.R.P.S., p. 103.)

The colour formers vary, of course, with the colour desired, but in general they consist of fairly concentrated solutions of the reagent in acetone, or methyl alcohol.

Some examples are:

Blue-violet	... alpha naphthol
Magenta	... Para-nitro-phenyl-acetonitrile
Yellow	... Acetoacetanilide

the solution strength in each case being about 1 gram to each 100 c.c.s. of solvent.

The above are stock solutions, and for use they are mixed in the proportions of 10 parts of the developer to 1 part of the colour former.

As the mixed solution does not keep, mixing should not take place until the mixture is required for immediate use.

Many of these chemicals are not readily available, and therefore if ordered by name difficulty may be encountered in getting a supply.

It is fortunate, however, that suitable solutions are already marketed in this country under the trade name of "Chrominox" by Messrs. P.A.C. Photographic Accessories and Chemicals, Ltd., for whom Messrs. Minox, Ltd., of 5 Victoria Street, London, S.W.1, act as distributors.

I am greatly indebted to the latter firm for the samples and literature sent to me for distribution this evening, and all the prints I have prepared for display as examples have been made by the use of "Chrominox" products.

Perhaps I ought to add the usual disclaimer, and most certainly I should state that any opinion or preference I may express is purely personal, and not to be regarded as having the approval of the manufacturers.

Now there are two ways in which we may obtain our coloured image. We can expose our bromide paper or lantern plate in the usual way, and then develop it in the special solution already mentioned, in which case the colour will be obtained directly; or we may use an ordinary black-and-white print, bleach it, and re-develop it in the colour developer mixture.

The latter method has much to recommend it, as being less likely to produce waste prints through the use of an unfamiliar developer, and also the second development can be done in white light, so that the colour tone can be more easily judged.

The bleacher is similar to that used for sulphide toning, and the recommended formulae for "Chrominox" products is:—

Potassium ferricyanide	... 30 grams.
Potassium bromide	... 20 grams.
Water	... 1000 c.c.s.

Immerse the black-and-white print in plain water for a few minutes before bleaching, as this enables the bleaching action to proceed more evenly. The bleacher acts quite quickly, and as soon as all traces of the black image have disappeared, the print should be given a brief but thorough wash, and then put into a bath of 2% sodium sulphite solution, in which it is left for about one minute.

This is the time to mix the developer and colour former stock solutions together, the correct former for the desired colour having, of course, been previously selected.

Final development can now be completed, after which the print should be washed for about 30 minutes. Washing should not be unduly prolonged, or the colour may be affected.

At this stage I would draw your attention to one or two points which should not be overlooked in processing.

1. The bleached print must be re-developed in a sufficient quantity of developer to ensure that development is complete.

2. If the print is made by direct development after exposure, it will require fixing in the usual way, but the fixing bath used must consist of plain (not acid) hypo, to which has been added about 2% of sodium sulphite.

3. As the image now consists of the original silver image, plus a dye image, there is some slight visual intensification.

4. Development in the special colour developer takes somewhat longer to complete than it would in an ordinary developer. It should therefore be noted here that as the dye is a product of oxidation, there is a tendency for the highlights to become degraded by a thin colour veil, owing to the action of oxygen from the air. It is desirable, therefore, to keep the print well immersed during development as a precaution, but even so there will be some slight action.

Let us consider now how we can control the colour, both in intensity and shade, by the means at our disposal.

We have noted that the image, after development in the colour developer, is composed of a mixture of silver grains and dye particles.

An obvious method, therefore, is to vary the relative proportions of these constituents from maximum silver with no dye (as in the original untinted print) to maximum dye with no silver.

Up to a point we can effect this by controlling the ratio of colour former to developer when mixing the two stock solutions prior to development. We can also stop the colour development at some intermediate stage, and complete the development of the print in, say, M.Q. or Amidol.

If we decide that a pure dye image is our ideal, the silver can be entirely removed by our old friend Farmer's reduced. The dye in turn can be removed by the application of 1% hydrochloric acid, either locally or over the print as a whole.

If the latter is applied to a print in which the image consists of both silver and dye, the silver will be left untouched, and could, of course, be bleached and retoned if desired.

A dye image with very little silver could be produced by re-bleaching after colour development, and then partially developing in a weak solution of, say, M.Q. As soon as the required quantity of silver has been regained in the image, the print must be fixed in plain hypo, and washed in the usual way.

It will be seen, therefore, that with one colour former alone a considerable variation in tone is possible. Even when we have exhausted the resources of this one colour former, there is nothing to prevent the use of a mixture of two or more formers, so that the field for exploration is very large.

The "Chrominox" formers at present available are: blue, cyan (blue-green), red, yellow, green and sepia.

The exact colour obtained in each case may vary slightly with different papers, and it should be noted that chloride papers are not suitable for direct development in the colour solution, although they can be used by the bleach and re-development method.

It will be evident from the foregoing that there is a wide field for the experimenter, while the colour worker will also be interested in the production of prints in natural colours on these lines using his separation negatives.

For this purpose a print must be made on a stripping base from each of the three negatives, using the appropriate dye with each, and finally superimposing the three, after stripping, to form the final picture.

From the series of prints I have made as illustrations to

much restored as well as enlarged.

The later Saxon church was usually stone built, and consisted of a small rectangular building with a narrow opening in the east wall leading to a small semi-circular or rectangular chancel or sanctuary. These churches were mostly on the north side of the hamlet or village, often near the manor house, and usually on the north side of the burial ground, as it was considered unlucky to be buried in the shade of the church.

The next step in evolution consisted in enlarging the chancel and usually the archway thereto. Then the nave became too small, so side lean-tos were made, piercing the walls with arches and making thereby the aisles; or else transepts were formed to the north and south. Later, often the aisles and transepts were enlarged to the east, making the church again a large rectangle with a row of piers and arches down both north and south sides. To provide more light, the nave, and at times the chancel walls, were raised and a series of windows provided above the level of the aisle roofs—the clerestory. Side chapels, porches and vestries were added as required.

This then is the principle on which the parish church is founded, and it can be seen that we will find churches in all stages of this evolution and containing, therefore, fragments of all ages from the date of the original foundation. Some churches, it will be observed, were built *de novo* on the plan and have remained much the same, as at Kegworth. Often they have been enlarged piecemeal, whilst others have been pulled down and rebuilt.

This evolution of the church was brought about in two ways—firstly, the increase in the numbers of converts and in the population, made larger churches necessary; secondly, the advance in engineering and architectural knowledge made it possible.

The straight stone lintel supported on piers made windows and arches small and the walls disproportionately thick. The Romans evolved the rounded arch with keystones, giving greater strength but needing massive centerings when building large openings. Gradually the art of making large arches and windows with lightweight walls became established, and from what must have been dark gloomy caverns, lit only by slits in the massive walls, emerged the pre-Reformation church of large windows, delicately glazed in glowing-coloured glass, supported by a minimum of stonework, itself a masterpiece of the stonemason's art. Stratford-on-Avon is a magnificent example.

Our Victorian archaeological ex-

perts had great delight in tracing this evolution and labelled each successive phase to their own satisfaction, but the experts of to-day apparently recognise that definite date labels are impossible when the difficulties in travel, the distances and the dearth of desirable materials in certain districts are recognised.

All things considered, it is a wonder that the evolutionary plans were so widespread, and so similar in far-flung areas.

The windows and arches apparently give the clue to most of these changes.

The Saxon types were short, narrow and round-headed. Windows had a narrow splay outside and a wide one inside. The opening was small, glass being non-existent.

The Norman types were, though small, larger, still round-headed, and arches being supported on massive pillars, doors showing many recessive "orders." There was much more ornamentation and light. Glass was coming into use, and in consequence the conditions inside must have been more pleasant. This Norman phase appears to have lasted till about 1140. From that date till about 1170 changes to the Gothic style from the Romanesque were being made. This stage is commonly termed the "Transitional." There is confusion of styles to be seen, but chiefly the emphasis appears to have been on less ornamentation and greater use of mouldings with arches and lancet windows in groups of two or three.

From about 1170 to 1260 the first



Kirby Bellars Broach Spire;
one of the finest in the country

K. K. Drury,
M.D., A.R.P.S.

THE BOOKSHELF

The Theory of the Photographic Process. By C. E. Kenneth Mees. Pp. 1,124. New York: The Macmillan Company. 12 dollars.

C. E. K. Mees and S. E. Sheppard published their first joint paper on photographic theory in the *Journal of The Royal Photographic Society* in January, 1903. During the next few years this was followed by many others which appeared in collected form in 1907 in a book ("Investigations on the Theory of the Photographic Process") bearing almost the same title as the volume now under review.

When these young University College students began their studies, the photographic industry was already about twenty-five years old, a period during which the theories of van't Hoff and Arrhenius had taken root and had given rise to the new branch of science known as physical chemistry, while the more recent discoveries of radioactivity and X-rays had brought about a complete revolution in scientific thought.

The time was accordingly ripe for the application of the newer chemistry to photographic problems, and Mees and Sheppard rapidly gained reputations as well-equipped pioneers in this field. A few years later Dr. Mees became chief chemist to the Eastman Kodak Company in Rochester, U.S.A., where, after a short interval, Dr. Sheppard joined him. Together they have built up that research organisation which has contributed so large a share to our present knowledge of the underlying principles of photography.

Dr. Mees duly acknowledges, in an introduction, his indebtedness to a number of his staff and others for writing or reviewing parts of his book, and it was a happy thought to requite his special debt to Dr. Sheppard by dedicating the volume to him.

In principle it is doubtless preferable to proceed from the simple to the more complex, and logically, the study of such a complex product as a photographic emulsion should have been preceded by the complete elucidation of the mechanisms of fluorescence, phosphorescence and the related phenomena displayed by numerous crystalline substances, to which the various reactions of the silver halides to light and X-rays are so closely allied. It is doubtless due to the existence of a profitable industry able to equip and maintain laboratories devoted to research that

the far more intricate problems underlying the practice of photography were tackled before rather than after the relatively simpler ones here referred to.

The book deals with the scientific aspects of photography with gelatin-silver halide emulsions. Emulsion making processes are discussed in broad outline only, but more than this was not to be expected. On the other hand, the chemistry and physics of the materials used in their manufacture, or in subsequent processes, are very fully discussed, special sections being devoted to gelatin, grain size distribution of the silver halide crystals, sensitising dyes, developing agents, fixing and hardening baths, intensifiers, reducers and toning processes.

Other chapters deal with the apparatus and methods of sensitometry and the measurement of spectral sensitivity, the physics of the developed image (graininess, resolving power, etc.), and photographic aspects of sound recording.

The chapters dealing with developers, intensification, reduction, toning and sensitisers and desensitisers are those which will prove of greatest interest to those seeking a solution of some practical problem of a chemical character.

The remainder of the book is devoted to those more recondite aspects of the subject which are peculiarly "photographic," namely, theories of the latent image, reciprocity failure, solarisation, and those special effects which bear the names of Herschel, Sabattier, Clayden and Albert, and, finally, a special chapter is devoted to the mechanism of optical sensitisation. It is worth recording, moreover, that a certain number of hitherto unpublished observations are embodied in the text.

The above brief summary of the matters dealt with can give no adequate idea of the scope of this remarkable book, which will prove an indispensable guide, not only to those intending to enter the field, but also to the many who are already engaged in photographic research.

The author traces, step by step, the historical evolution of ideas, with the facts upon which they were based, in arriving at the theories at present in vogue. This method imparts a pleasing continuity which serves greatly to maintain the reader's interest.

The masses of experimental data

available are so large that the writers of the various chapters had of necessity to exercise considerable judgment in selecting the material on which to base their views, but it can safely be said that it would be difficult to name any other body of workers in this field who are better qualified to act as guides through the maze. Moreover, the value of Dr. Mees' book in this respect is greatly enhanced by the bibliographies at the close of each chapter and the very complete indexes, so that where the reader is doubtful about the interpretation put upon his own or others' work, the original can be readily consulted. The reviewer has noticed one or two observations which he believes to be slightly misleading in this respect, but they were relatively unimportant.

All who are interested in trying to unravel the knotted skein of the chemical and physical theories of photography and the methods employed in the process will welcome wholeheartedly the story told by Dr. Mees and his colleagues, and will feel deeply indebted to him for the thorough and painstaking way in which he has fulfilled his self-imposed task.

F. F. RENWICK.

A New A B C in Colour Photography—Designed by George A. Adams; Photographed by Paul Henning. **Cinderella**—A Fairy Tale in Colour Photography—Dolls designed and made by Amelia Serkin; Photographed by Paul Henning. London: Collins. 5s. each net.

These may seem strange publications for review in *The Photographic Journal*, but in fact, since both books represent important extensions of the use of colour photography, they are of interest to many of us.

In the case of the A B C, the publishers point out that form and colour are not dissociated in a child's mind, and colour photographs have, therefore, a great advantage of black-and-white in the teaching of the alphabet. The twenty-six full-page illustrations are reproduced in four-colour half-tone, twenty-five of them from separation negatives and Dufaycolor guides provided by Paul Henning. The majority of the subjects are still-life, but a notable exception is E for Elephant, which is reproduced from the Technicolor negatives of a single frame from a *World Window* travelogue.

The sixteen whole-page illustrations of "Cinderella" comprise specially designed dolls, arranged in appropriate model settings, and photographed by Paul Henning, the engraver again being provided with

in negatives and transparent guides. Children will finally pronounce a new venture in colour photography (the publishers say more to follow), but I can at two of the adults who saw looks wistfully expressed that they had been born so soon.

JACK H. COOTE.

British Journal Photo-Almanac, 1943. Henry God & Co., Ltd., London. 6d. paper covers; 5s. cloth

s always been debatable the advertisement pages of *Almanac* did not command interest and attention than the other hand, there are no claim that it is the collection of tables, followed by epitome of progress and the new goods that is the prime

ere fact that such discussion place is evidence that the holds a unique place in photography. Hence there are few photographers who do not hard to the beginning of every the appearance of the annual

year it is actually slightly an last, having, in fact, eight ges. It has a new and very ction—"Photographic Documentation"—which epitomises materials and apparatus for his rapidly developing and important branch of photo-

is a review of "The Shape of phy to Come," by the which suggests the main development in the near apparatus and materials; e on "Photographing Bees," useful collection of hints e to a much wider sphere; with a somewhat forbidding elementary Practical Developmentics," which really deals balance of a developer and trols it and how, and a most account of how photography has been developed and in a school with the title raphy and Education."

st two articles are also of ing merit, namely, "Progress ee-Dimensional Cinematography" and "Photography for gists."

ther an outstanding achievement these days, and, as usual, the bargain in photographic extant.

H. W. GREENWOOD.

THE ALLIANCE

NEW PORTFOLIOS AND LANTERN SETS

A new Portfolio of Prints, being a selection from the 1942 Competition, is now ready for circulation among photographic societies. The prints number 49, and are accompanied by a critique from the pen of Mr. Bertram Cox, Hon. F.R.P.S.

Three new boxes of Lantern Slides are also available. One of these is a selection from the 1942 Competition, the commentary being by Mr. G. E. W. Herbert.

A second box of his own slides has been given to the Alliance by Mr. Herbert, and in this case the accompanying script consists of a compendium of abstracts from the criticisms, favourable or otherwise, to which they have been subjected during the past two years, while circulating in the monthly portfolio of the Amateur Postal Camera Club (Slide Section).

The third box consists of a selection of R.P.S. Exhibition Slides, mostly those of 1942--a few of them acquired by purchase, but the majority of them freely given to the Alliance for the benefit of local photographic societies. More than 60 slides were so acquired, and to one and all of their authors the Alliance tenders warm thanks. From these slides a circulating box will be kept up to a strength of 48 items (with a commentary by Mr. G. A. Forman, A.R.P.S.), the remainder of the collection being held in reserve for replacement of any slides that get damaged beyond repair.

Such mention of the necessity for providing for the replacement of broken slides brings up once more the evergreen problem of safety in transit for our slides. Our strong, ironbound boxes have to be sent by parcels post, and of late years they have been subjected to considerable mauling while in transit. Not only do the slides get cracked, sometimes "spidered," but the boxes themselves return in a damaged condition that bears witness to extremely rough handling in one quarter or another. Wooden boxes nestling in a snugly-lined wicker basket have fared just as badly. It is accordingly a matter of the gravest concern to the Lectures Sub-Committee; and the experiences and recommendations of readers of *The Photographic Journal* for countering this menace would be gladly welcomed.

The 1940 Competition Slides have now been returned to the Federations, and their condition, as tabled below, will show the extent to which slides

can suffer during a circulation of rather more than two years.

Alliance Competition Slides, 1940

	Selected for circulation.	Returned undamaged.	Returned cracked.	Withdrawn: smashed.
Central Assoc'n	10	8	1	1
L. & C. P. U.	16	3	11	2
Northern Fed'n	7	4	2	1
Yorks P.U.	18	9	8	1
	51	24	22	5

We do not, of course, shut our eyes to the fact that many, possibly very many, of these breakages are due to careless handling by local lanternists, and the Committee looks for a loyal observance by secretaries and others of the injunctions printed on the recently introduced form which is despatched with each box, and which is intended for the Society's use when next booking a set of lantern slides.

A New Lantern Lecture

Part three of Mr. Dudley Johnston's "Development of Pictorial Photography" can now be booked by Societies, and it is good news that he is engaged in completing this work by bringing his history up to the present time.

Readers interested will remember that the subject of these lectures has been dealt with very completely in the reports of the Centenary Lecture to be found in the April, 1939, number of the *P.J.*, and of a later lecture reported (unfortunately without illustrations) in the September number of 1942.

The lecture now added to our list deals with what was in its time self-styled the "New Photography," the revolutionary period commencing about 1910—a period of "stunts" and deliberate affectations perpetrated with the object of creating sensation. The efforts of the pictorial workers of that day, at any rate, the extremists, would evoke little admiration from the present generation, but their place in the history of picture-making by photography cannot be ignored, and the story is of absorbing interest.

G. E. W. HERBERT.

ITEMS OF INTEREST FROM VARIOUS QUARTERS

THE FILM IN EDUCATION

The Annual Report of the British Film Institute, recently published, covers the work of the Institute during the period 1941-1942, and contains many matters of general interest. It mentions that a contribution to the development of the use of visual aids was a memorandum submitted by the Institute to the Board of Education on the position of optical aids in post-war education. The main suggestions were as follows:

- (a) That the educational film supply should be solved by means of a series of Regional Film Libraries.
- (b) That the Board should encourage the purchase of projectors and optical aids over a ten-year period, with the object of getting some 15,000 silent and 3,500 sound projectors installed in the schools.

The Institute's Educational Panel has drawn up a list of subjects on which films are urgently needed to fill gaps in the existing supply.

Another interesting development was its success in persuading the Principal of the University College of the South-west to establish experimentally the first Lectureship in Visual Education to be founded in the United Kingdom.

In connection with the Institute's Information Department the following new lists have been produced:—

- List of films suitable for first-aid instruction.
- List of films on aviation and kindred subjects.
- List of films on domestic science.
- List of films on housing and town planning.
- List of 35 mm. French feature films now available.
- List of films suitable for youth organisations.
- List of films to illustrate school broadcasts.
- Supplementary list of books on cinematography.
- Propaganda list (revised).
- List of libraries (revised).
- Agricultural list (revised).
- A list of films on the countries now at war, and revised editions of the list of foreign films and industrial films are in preparation.

Reporting on the National Film Library, the most important single acquisition is believed to be the London Film Society collection of

123 films, nearly all of them important, and many of them unique copies. This collection has been entrusted to the Library on certain conditions for the duration of the war and at least a year thereafter.

A large number of short films and documentaries were added to the Library, among them being 72 films of the Ministry of Information, 23 films from the British Council, 6 Disney shorts, and 5 of the most historically important "Secrets of Life." In all, 285 films were acquired by gift or purchase during the year, totalling some 500,000 feet.

It is reported that the Privy Council included in the Institute's grant for 1942 a sum sufficient to allow for two more special blocks, each of twelve vaults, to be built for storing the films, in the Preservation Section. This doubles the storage accommodation.

In the Loan Section the number of subjects now available is given as 68. The most notable addition during the year has been "Film and Reality," a composite film made for the Library by Cavalcanti. Within the space of one hour and forty-five minutes it seeks to illustrate the various uses which have been made of actuality material in the cinema, from its earliest days to the outbreak of the present war. Some 50 extracts from well-known interest films, travel films, news-reels, science films and documentaries of all countries are included, and in its introduction and conclusion the film deals with the relationship of this realist trend to the ordinary fictional film. It is the first attempt hitherto made at what might be described as a film essay in criticism, and as such marks an important development in the stimulation of film appreciation through the film itself.

The report mentions that in Scotland the outstanding feature of the year's activities of the Scottish Film Council has been the remarkable growth of the Scottish Central Film Library, which distributed 31,821 reels of film to schools, adult education bodies, youth organisations, churches and H.M. Forces. A report has been prepared for the Carnegie U.K. Trust on this experiment in the organisation of a regional library of educational films.

The chief findings of the experiment may be summed up as follows:

1. 1,313 educational bodies are now using the Library.
2. Few, if any, schools projectors in Scotland are not being used regularly.
3. The Library has solved many of the difficulties of booking and selection of educational films which existed before it came into being.
4. The wide range of films has enabled educationalists to fit films into the existing curricula thus ensuring a more intensive use of films.
5. The Library can claim considerable credit for the rapid growth of the use of the film in adult education.
6. Invaluable experience has been gained in the organisation and costing of regional film libraries.

The report concludes with the interesting item that there are now seven scientific film societies in Scotland, and the first scientific film conference was held at Ayr in August.

It was resolved at the conference to form an Association of Scottish Scientific Film Societies.

Edinburgh Photographic Society

The 81st Annual Open Exhibition, organised by Edinburgh Photographic Society, will be held in the Society's Rooms, 16, Royal Terrace, Edinburgh, from 27th March to 10th April, 1943.

There are four classes: (1) Portraiture and Life; (2) Landscape and General; (3) Lantern Slides (a) Monochrome (b) Natural Colour; and (4) Natural History Prints and Transparencies.

The following is the Panel of Selectors: A. R. Shurrock, R.S.A., J. Campbell Harper, A.R.P.S., J. T. Knight, A.R.P.S.

Entries must be the entire work of the entrant, except mounting and Natural Colour Slides, where commercial processing must be stated.

Prints to be mounted on standard size light mounts, titles, class and name and address of exhibitor (corresponding with entry form) to appear on back. Slides to be standard sizes, 3½ or 2 inches square. Titles, name and address to appear on the containers.

A non-returnable entry fee of 3s. 6d. is payable from entrants, which will include cost of return carriage. Up to four entries will be accepted from any one entrant, one print or four lantern slides to be one entry.

A collective entry from a club (not less than three members) will be accepted at the rate of 6d. per print, provided there is a minimum of

nts. Such an entry must be in one container. Return must be paid.

s, signed entry forms, and reach the Hon. Exhibition not later than Monday, 8th 1943. Packages containing must bear the sender's name ss.

entry will be placed before a selectors, who will decide if ed exhibition standard has hed, and their decision will lantern slides will be shown en conditions permit. Under ar conditions the Society ed not to make awards at ition.

orms and all further inform-be obtained from the Hon. 1 Secretary, A. H. Gillies, 1 Photographic Society, 16, rrace, Edinburgh 7.

Film Conference
ference on "The Film in Life" is being arranged by 1 Film Institute, and will be e University College of the st, Exeter, between April th.

ference, of which the e will be circulated as soon e, will concentrate on the of the film in society, with eference to children and s. It is also intended

opportunities for seeing of apparatus used in 1 with the employment of ds for instructional pur-to stage a number of shows itish and American films of 1 and educational signifi-

for the week-end will not ee-and-a-half guineas, and be less.

ial invitation has been by the Institute to Mem-re R.P.S. Kinematograph attend the Conference, and ersed are referred for ticulars to the Secretary, h Film Institute, 4, Great reet, London, W.C.1.

Image—Warning!

has previously been made ges of the urgent need for eels for roll films. Although ngs of the manufacturers heeded to a large extent, it that many roll film users t aware of the seriousness tion. Put bluntly, the con- ply of roll films depends on iging the reels, because no re being made.

all readers to return their s to their dealers, who will on to the manufacturers. be remembered that bent

or rusty reels cannot be used again, and, therefore, reels should be hand- led and packed with reasonable care and, before being returned, should be kept in a dry place.

The late Captain W. H. Jackson
Concerning that remarkable veter- an photographer, Captain W. H. Jackson, Hon. F.R.P.S., of New York, who died a few months ago, at the great age of 99, Mr. Ronald L. Ives, A.R.P.S., of Toole, Utah, writes:—

"In mid-June, between trains, I was able to call on Captain W. H. Jackson for a couple of hours, and found him very feeble but clear-headed and still working on his paintings. We had a very pleasant and informal discussion of the areas that he photographed and mapped in 1872, and on which I worked in 1932, until the beginning of the war in Europe.

Those who knew Captain Jackson will never forget him; his work begun with such painstaking care three-quarters of a century ago, will still be appreciated three-quarters of a century hence."

An obituary notice, recording the main events in Captain Jackson's career, appeared in our November issue, 1942.

OBITUARIES

Alfred T. Mole

The death was announced on the 20th November last, at the age of 75, of a former Associate, Mr. A. T. Mole, well-known in photographic circles as an enthusiastic exponent of stereoscopic photography. For close on forty years he was associated with the United Stereoscopic Society, becoming Secretary in 1914 and President in 1917. His efforts were untiring in winning over proselytes to what he regarded as the only worth-while photography, and the very survival of this branch of work owes much to his persistency in its advocacy. For many years he acted as a judge on the Selection Committee of the Stereoscopic Section of the R.P.S. Exhibition, in which he was himself a constant and prolific exhibitor.

Herbert Pickwell, A.R.P.S.

A further loss to the world of Club Photography, and in particular to the Central Association of Photographic Societies, has occurred in the sudden death, on 26th January last, of Herbert Pickwell, at the early age of 57.

His interests in amateur photography date back to days prior to 1910, by which time he had become a member of the South London P.S.—a society of which he was in later years, on many occasions, elected President. During the Great War he served abroad (in Crete, Mudros and Mitylene) in the Photographic Section of the Royal Naval Air Service, afterwards merged into the R.A.F. On the war's conclusion, he became an active member of the Affiliation, and was well known and in frequent request for his lectures, delivered personally,

Chicago Salon

The Second Chicago International Salon of Photography will be held at the Chicago Historical Society from June 1st to September 7th, 1943. The Salon will combine the Chicago Historical Society's First Annual International Salon of Photography and the Chicago Area Camera Club's Association Chicago Pictorial Salon of 1942.

We understand from the Chairman of the Salon Committee, Mr. Stuyvesant Peabody, that overseas exhibitors are invited to send not more than four unmounted prints to the Salon. The entry fee of one dollar is waived, and they need not trouble about the entry form. The work should be their own throughout, and should be mailed to reach the Chicago Historical Society, Photo Department, Clark Street, at North Avenue, Chicago, Illinois, U.S.A., not later than May 1st.

All accepted prints will be mounted and glazed by the Salon Committee, and will be returned immediately after the close of the Exhibition.

Other exhibitors should apply to the Chicago Historical Society for the entry form and all further information.

In private life Alfred Mole was a teacher of the violin, and an extremely proficient performer on that instrument, whether in quartet-playing or as an orchestral leader. His activities in various other directions were ardent and numerous. In youth he took up the hobby of cycle racing. This was in the days of the "penny-farthing," upon which contraption he won a great reputation, and was known as the "Flying Mole." In later days he became a well-known figure on the bowling greens, and only a few weeks before his death he won the championship of his local club.

A man of many resources, active and avid of life to the last, his loss will be mourned by a host of friends and acquaintances.

on "Wild Flower Photography," "The Monuments of London," "The Pilgrims' Way Through Surrey," and "Rambles in East Anglia." For two years he was Chairman of the Central Association, and afterwards served on the Alliance Executive Committee, undertaking the onerous duties of Convener of the Lectures Sub-Committee, a task which necessitated continuous hard work on behalf of the various Federations.

Urbane and courteous ever, ready at all times, in an unassuming way, to help with advice or friendly criticism, he won for himself, and retained throughout his life, the warm regard of all who knew him, and his passing leaves a very distinct gap in the ranks of organised amateur photography.

G. E. W. HERBERT.



The Setting and the Baby

child of eighteen months and sat him at the piano, which he immediately began to play after his customary fashion, and this gave another first-rate picture. Among his recent sitters had been the grandson of the famous "Bubbles" (of Millais), and the two Princesses, whose little dog, in the corner of the picture, supplied an amusing footnote.

As a final point on the psychology of child portraiture, Mr. Adams said that he was "such an unconventional chap" himself that he could not work with anything stiff in form. It was always his purpose to get into the child's mind; until he had done so he could do nothing at all.

After his very informal talk he answered a number of questions. The total weight of his camera, he said, was about 36lb. No question about it had arisen on his various railway journeys except once on the Great Western, when an official demanded a surcharge. In vain did Mr. Adams explain that if it were not for the camera he himself would not be travelling at all. That point did not get home, and the official insisted on his pound of flesh. Then Mr. Adams asked him if he had received any new instructions about

such matters during the last nine or ten years, and on his saying that he had not, he told him that about that length of time ago his professional association (now the Institute of British Photographers) had successfully contested a similar demand. A photographer had been surcharged six shillings and eightpence, or some such amount, and it had been refunded with apologies. On getting the authentic documents from Mr. Bucknall, the secretary of the Institute, and showing them to the official, his face was "worth a photograph." "My word," he said, "to think of the number of people I have unjustly charged." And he hung the documents up in his office, to remind himself not to offend again.

In reply to questions about his methods, Mr. Adams said that he always took sharp and softened to his liking, or to the psychology of the child, on the print, having a fairly good memory and considering that 95 per cent of a child's portrait should be psychology. The psychology, too, should be wrapped up in everything—in the print itself, in the mount, even in the signature, which should be written harder in the case

of a "hard" child than in the case of a "gentle" one.

He did not like, personally, a print that was too warm in colour. His idea of a print in colour was that the colour should not be describable; it should be impossible to say that it was black, or saffron, or anything else. The colour of the print should be subordinate to the picture on it. He found that, for reasons not easily appreciable, some negatives yielded a far better colour print than others.

He could not use a photometer, because he "had not the brains," and he could not use a miniature camera because he lacked the skill. He relied to a great extent on intuition. His friend, Mr. Bertram Park, who always uses a photometer, said to him once, "You know, Adams, I should have given double that exposure for that," but when the negatives were seen, as Mr. Park agreed, they gave him all that he wanted in the print. He was guided a little by the aperture at which he was working, and he balanced up the whole thing. Sometimes, after he had got the subject in focus, the sun would come out, in which case he would simply put in a smaller stop, and if the sun went in again he would take the stop out. He

wanted most of all a governable shutter that "shuts immediately you think," not one that dragged to open and dragged to shut. If he had to put up with dragging at all, he would prefer a shutter with a dragged opening rather than a dragged closing. In the case of children this quickness was specially necessary, because of the likelihood of movement of the hands all the time. Indeed, he said that if he could not draw a child's hand he would have to discard the larger part of his work.

Vote of Thanks

Mr. Adams's brief talk was "assisted" by the handing round of a large number of child portraits (made in country homes), which were greatly admired, and on the proposition of the CHAIRMAN a hearty vote of thanks was conveyed to him for an entertaining and instructive evening. Several of these prints are here reproduced.



At the Piano



The Grandson



The Newcastle Portrait



Boy with Rabbit



Ready for Bath

ANNOUNCEMENTS

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2 2s. 0d.; Group subscriptions, which became due for renewal on the same day, are as follows: Scientific and Technical Group, 7s. 6d.; Pictorial Group, 5s.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s.; Kinematograph Section, 5s.

Group subscriptions may be included with the Annual Subscription, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscriptions to the Society through their own Bank to The National City Bank of New York in New York, or direct to The National City Bank of New York. Such subscriptions should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square Branch, London, account. Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to ask them to mention their names, addresses and status (Fellow, Associate, Member); and Members making the remittance direct to The National City Bank of New York are requested to give this information.

It is important to note that payment should be made "For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the same time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

LECTURE SESSION

The following meetings will be held at 16, Prince's Gate, S.W.7 (unless otherwise stated):—

Friday, February 5th, 6 p.m. Informal Meeting of the Pictorial Group. Discussion on "The Present Trend of Pictorial Photography." Leader: F. E. Grattan, A.R.P.S.

Saturday, February 6th, 3 p.m. Meeting arranged by the Colour Group. "Separation Negatives from Dufraycolor Originals." By Major A. B. Cornwell-Clyne, F.R.P.S. and C. H. Beale, A.R.P.S.

Saturday, February 13th, 3 p.m. "Photography's Part in the War" (third year). By F. J. Mortimer, C.B.E., Hon. F.R.P.S., F.R.A.S.

Friday, February 19th, 6 p.m. Informal Meeting of the Pictorial Group.

Saturday, February 20th, 3 p.m. Meeting arranged by the Scientific and Technical Group. Symposium on Photomicrography.

Saturday, February 20th, 3 p.m. At the Gaumont-British Theatre, Film House, Wardour Street, W.1. Meeting arranged by the Kinematograph Section. "Cinematography in War Time." No. 1. "Film Making with the R.A.F." Wing Commander D. N. Twist.

Friday, February 26th, 6.30 p.m. Informal Meeting of the Kinematograph Section. Projection of Members' Films.

Saturday, February 27th, 3 p.m. Meeting arranged by the Miniature Camera Group. "Multi-grade and the Latest Technique in Using this Paper." By I. V. Chilton, F.R.P.S., of Ilford, Ltd.

Friday, March 5th, 6 p.m. Annual General Meeting of the Pictorial Group, to be followed by "My Hundred Best Lantern Slides," by J. Dudley Johnston, Hon. F.R.P.S.

Saturday, March 6th, 3 p.m. Meeting arranged by the Pictorial Group. A Talk by Lancelot Vining, F.R.P.S.

Tuesday, March 9th, 3 p.m. Annual General Meeting. Members, Associates, Fellows, only.

Saturday, March 13th, 2.30 p.m. Annual General Meeting of the Colour Group. 3 p.m.—"Making Colour Prints." By Jack H. Coote, F.R.P.S.

Saturday, March 20th, 2.30 p.m. Annual General Meeting of the Kinematograph Section. 3 p.m. Meeting arranged by the Kinematograph Section. "Sight and Sound in Sub-Standard Colour Film and Slow-Speed Recording." By Rex Calvert and Alex. Waters. Tanat (British) Corporation.

Saturday, March 27th, 2.30 p.m. Annual General Meeting of the Miniature Camera Group. 3 p.m. Technical and Pictorial Criticisms by D. McMaster, F.R.P.S., and Richard N. Haile, F.R.P.S.

Tuesday, March 30th, 5 p.m. Annual General Meeting of the Scientific and Technical Group.

Saturday, April 3rd, Meeting arranged by the Colour Group. "Some Difficulties of Reproduction." By H. V. Walters, B.Sc.

Saturday, April 10th. Annual General Meeting of The Photographic Alliance, followed by Executive Committee Meeting.

Saturday, April 17th, 3 p.m. Meeting arranged by the Kinematograph Section. "Cinematography in War Time, No. 5. 'The Development of Kinematography in the Army.'" By Capt. E. Stuart, R.A.O.C.

Saturday, April 24th, Easter. No Meeting.

JOINT MEETINGS

We have pleasure in announcing the following arrangements for Joint Meetings. Arrangements for similar Joint Meetings are being made by other Societies, and will be announced in due course.

Birmingham Photographic Society, York House, Great Charles Street, Birmingham.

Saturday, February 13th, 2.45 p.m. Lantern Lecture, "Photography in War Time." By G. B. Mason.

Tuesday, March 9th, 6.30 p.m. Cine Films, "Everybody's Birds," etc. By John Clear, F.R.P.S.

Bradford Photographic Society, Mechanics' Institute, Bradford.

Saturday, February 13th, 3 p.m. "Gum-Bichromate Multiple Printing: Some Recent Experiments." By G. Halford, A.R.C.A., F.R.P.S.

Manchester Amateur Photographic Society, 49, Lower Mosley Street, Manchester.

Saturday, February 6th, 3 p.m. Lecture by D. McMaster, F.R.P.S.

Leicester and Leicestershire Photographic Society, at the Waterloo Hall, Waterloo Street, Leicester.

Tuesday, March 2nd, at 6.30 p.m. "Lighting for Figure Studies: Outdoors and Indoors." By Anthony Peacock, A.R.P.S.

Rotherham Photographic Society, The Crofts, Moorgate, Rotherham, Sunday, March 14th, 3 p.m. "Old Rotherham." By Miss D. Green and T. Salvin.

EXHIBITIONS AT 16, PRINCE'S GATE

February 4th to 27th. (1) Prints by Members of Manchester Amateur Photographic Society, 1933-1942. (2) Prints by Members of The Oval Table Society, New York.

March 4th to 31st. (1) Miniature Camera Group Members' Exhibition. (2) Prints from the Permanent Collection.

April. (1) Prints by Overseas Readers of *The Amateur Photographer*. (2) Natural History Prints by Captain G. K. Yeates, F.R.P.S.

July. (1) *The Amateur Photographer* Prize Competition Prints. (2) Colour Photography.

Sept.-Oct. R.P.S. Annual Exhibition.

Fellowship and Associateship

Notice is hereby given that applications for the Fellowship and Associateship in all Sections will be considered by the Advisory Committees appointed by the Council. Associates desiring to take up the Fellowship, and Members desiring to take up the Associateship in any Section, should address their applications to the Secretary not later than April 1st on forms to be obtained from him at 16, Prince's Gate, S.W.7.

The Advisory Committees in all Sections will meet half-yearly in future, in April and October.

R.P.S. MEMBERSHIP

In order to stimulate a more direct interest in the activities of the R.P.S. among members of affiliated societies, and at the same time to afford officials an incentive to benefit the financial position of their own societies, the Council of The Royal Photographic Society offers a special rebate of 15 per cent of the first year's subscription of each member of an affiliated society who joins the R.P.S.

The primary object of membership is to assist the Council in furthering the advancement of photography, but there are many privileges incidental to membership, including the receipt of a copy of this *Journal* immediately upon publication each month.

The Associateship and Fellowship will naturally interest those who have progressed in the art of science of photography. These are coveted distinctions, and are accepted universally as evidence of genuine photographic ability.

The entrance fee of one guinea is already waived to members of affiliated societies, and the amount of the rebate to the societies to which the new members belong will therefore be 10s. 6d. in each instance.

Secretaries of affiliated societies are invited to give their careful attention to this scheme and to co-operate in making it successful. The Secretary of The Royal Photographic Society will be glad to give them further particulars and to furnish copies of the Society's prospectus, or to communicate direct with prospective members if they will furnish their names and addresses.

Masterpieces of Photography

A selection of 36 pictures from the Permanent Collection of The Royal Photographic Society.

Price 5s. 9d., including postage

16, PRINCE'S GATE
LONDON, S.W.7

much restored as well as enlarged.

The later Saxon church was usually stone built, and consisted of a small rectangular building with a narrow opening in the east wall leading to a small semi-circular or rectangular chancel or sanctuary. These churches were mostly on the north side of the hamlet or village, often near the manor house, and usually on the north side of the burial ground, as it was considered unlucky to be buried in the shade of the church.

The next step in evolution consisted in enlarging the chancel and usually the archway thereto. Then the nave became too small, so side lean-tos were made, piercing the walls with arches and making thereby the aisles; or else transepts were formed to the north and south. Later, often the aisles and transepts were enlarged to the east, making the church again a large rectangle with a row of piers and arches down both north and south sides. To provide more light, the nave, and at times the chancel walls, were raised and a series of windows provided above the level of the aisle roofs—the clerestory. Side chapels, porches and vestries were added as required.

This then is the principle on which the parish church is founded, and it can be seen that we will find churches in all stages of this evolution and containing, therefore, fragments of all ages from the date of the original foundation. Some churches, it will be observed, were built *de novo* on the plan and have remained much the same, as at Kegworth. Often they have been enlarged piecemeal, whilst others have been pulled down and rebuilt.

This evolution of the church was brought about in two ways—firstly, the increase in the numbers of converts and in the population, made larger churches necessary; secondly, the advance in engineering and architectural knowledge made it possible.

The straight stone lintel supported on piers made windows and arches small and the walls disproportionately thick. The Romans evolved the rounded arch with keystones, giving greater strength but needing massive centerings when building large openings. Gradually the art of making large arches and windows with lightweight walls became established, and from what must have been dark gloomy caverns, lit only by slits in the massive walls, emerged the pre-Reformation church of large windows, delicately glazed in glowing-coloured glass, supported by a minimum of stonework, itself a masterpiece of the stonemason's art. Stratford-on-Avon is a magnificent example.

Our Victorian archaeological ex-

perts had great delight in tracing this evolution and labelled each successive phase to their own satisfaction, but the experts of to-day apparently recognise that definite date labels are impossible when the difficulties in travel, the distances and the dearth of desirable materials in certain districts are recognised.

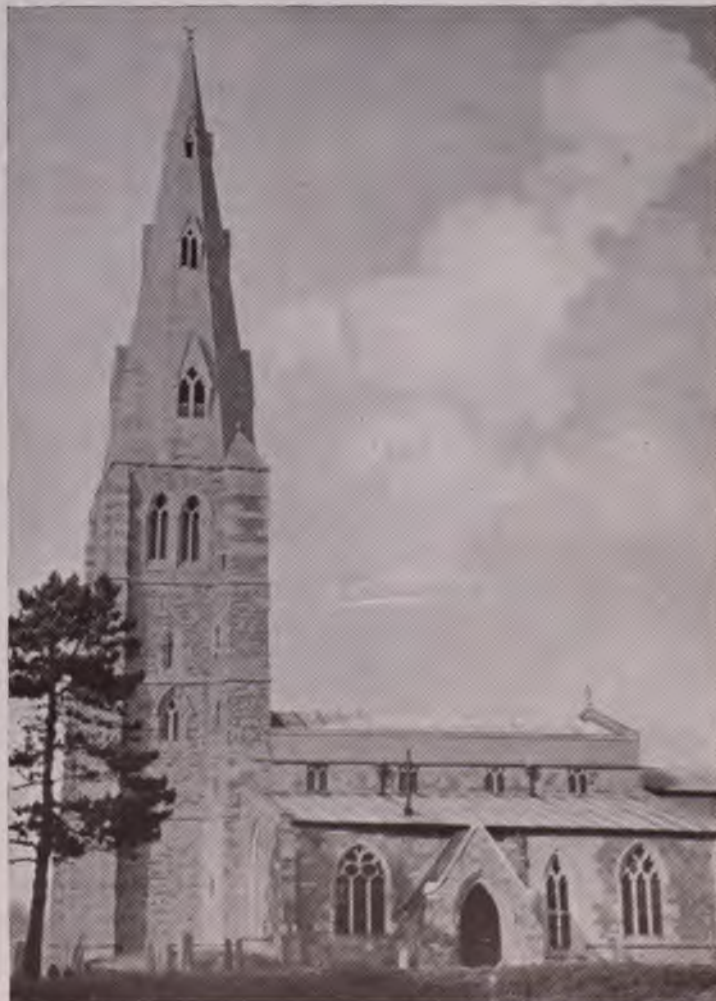
All things considered, it is a wonder that the evolutionary plans were so widespread, and so similar in far-flung areas.

The windows and arches apparently give the clue to most of these changes.

The Saxon types were short, narrow and round-headed. Windows had a narrow splay outside and a wide one inside. The opening was small, glass being non-existent.

The Norman types were, though small, larger, still round-headed, and arches being supported on massive pillars, doors showing many recessive "orders." There was much more ornamentation and light. Glass was coming into use, and in consequence the conditions inside must have been more pleasant. This Norman phase appears to have lasted till about 1140. From that date till about 1170 changes to the Gothic style from the Romanesque were being made. This stage is commonly termed the "Transitional." There is confusion of styles to be seen, but chiefly the emphasis appears to have been on less ornamentation and greater use of mouldings with arches and lancet windows in groups of two or three.

From about 1170 to 1260 the first



Kirby Bellars Broach Spire ;
one of the finest in the country

K. K. Drury,
M.D., A.R.P.S.



The Duet; T.R.H. The Princess Elizabeth and Princess Margaret Rose

WAR-TIME PORTRAITS OF OUR CHILDREN TAKEN IN THEIR COUNTRY HOMES

By Marcus Adams, F.R.P.S.

AT a meeting of the Pictorial Group of The Royal Photographic Society, held on Friday, January 8th, 1943, with Mrs. Rosalind Maingot, F.R.P.S., in the chair, Mr. Marcus Adams, F.R.P.S., described his recent experiences in child photography, not in a London studio, nor in a studio anywhere else, but chiefly in the children's own homes in various parts of England, Scotland and Wales. To go to his little sitters in the country has meant long and tedious railway journeys, even to the north and west of England, and has also exercised to the full his talent for improvisation, and for making the best of, sometimes, limited accommodation, far from ideal lighting arrangements, and the occasional eccentricities of hosts and hostesses, although these last have been mostly forgotten in the general kindness and welcome. Mr. Marcus Adams mentioned a dozen

towns and wayside country districts to which his quest has taken him, and he also told of some adventures, including such as befall every railway traveller nowadays in black-out hours, but also some unusual ones, like the bombing of the rear of his train by an enemy raider.

After describing how he managed about lighting and reflectors, Mr. Adams produced his camera. He said that he forswore the reflex, as he wanted "bare eyes" all the time, to look into the eyes of his sitters. He therefore devised a camera, making it in three months in his spare time, using all sorts of junk for the purpose, having been a collector of trinkets and useful junk all his life, thus having accumulated thousands of screws and bolts and nuts and all sorts of gadgets. It was a very exciting job to assemble this thing together and to get it to work successfully. It was a

little heavy, especially when changing trains at country stations in the black-out, but it answered its purpose. He personally did not believe in a tilting back; he kept the camera back perfectly square, tilting only the lens to get sideways focus. This idea was inspired from the construction of the eye; we did not tilt the back of the eye but the front of it.

The camera ran on castors, and its height was adjusted by attachment to a pair of tall steel rods, up and down which it slid, and could be fixed at any desired position. Exposure was made by means of a rubber tube and bulb. The shutter worked at one speed, about 1/12th second. He never carried a black cloth, being against anything which intervened between himself and his sitter, but he showed a piece of old leather in which he inserted his focussing glass; by this means the leather covers the ground glass and cuts out all back lights, thus employing this to get his focus. His plan was to focus on the eyes and the hands, and to let everything else go. He did not use the screen to compose his picture.

Mr. Adams, in his own inimitable way (which is quite unreportable), described some of his experiences in hotels and country houses. Sometimes he had to work under very cramped conditions; at other places he had his heart's desire. Once a delightful nursery was placed at his service, to soon become a studio, and here he did forty sittings in one week. It was hard going, the more so because, although he had to pretend to go to bed at 10.30, in reality he stayed up until 1.30, carrying out various preparatory work, changing films, etc.

There were advantages and disadvantages in photographing children in their own homes. They were likely to be more at ease than in strange surroundings; on the other hand, it was difficult to arouse their interest by something out of the ordinary. Mr. Adams told how he cultivated in himself the role of stupidity and foolishness, leading a young thing of six to suppose that he did not know the difference between a feather fallen from a bird and a leaf fallen from a tree, and that he was similarly ignorant of the elementary principles of natural history. The child thereupon took a superior air, began to pity him, discovered that in spite of his appearance of adulthood he was only a child, and a younger one at that, and the beginnings of an understanding, which presently issued in a natural portrait, were laid.

Sometimes Mr. Adams resorted to further guile. One little lad resolutely announced that he was not



H.R.H. Princess Margaret Rose

going to have his portrait taken. Mr. Adams thereupon said in all innocence that he had never thought of such a thing, and that the object of his visit was to photograph the child's pet rabbit. On the child demanding who gave him the necessary per-

mission to photograph this animal, he said that it was the child's mother. But he got the child, still protesting that he never would be photographed, to hold the animal, and the result eventually was a very charming portrait, which, with many other exam-

ples of his recent work, Mr. Adams was able to hand round among the company. In another case, the work was done in a small room in a cottage, already occupied by a Christmas tree and a piano, along with other furniture. The mother brought down the



The Setting and the Baby

child of eighteen months and sat him at the piano, which he immediately began to play after his customary fashion, and this gave another first-rate picture. Among his recent sitters had been the grandson of the famous "Bubbles" (of Millais), and the two Princesses, whose little dog, in the corner of the picture, supplied an amusing footnote.

As a final point on the psychology of child portraiture, Mr. Adams said that he was "such an unconventional chap" himself that he could not work with anything stiff in form. It was always his purpose to get into the child's mind; until he had done so he could do nothing at all.

After his very informal talk he answered a number of questions. The total weight of his camera, he said, was about 36lb. No question about it had arisen on his various railway journeys except once on the Great Western, when an official demanded a surcharge. In vain did Mr. Adams explain that if it were not for the camera he himself would not be travelling at all. That point did not get home, and the official insisted on his pound of flesh. Then Mr. Adams asked him if he had received any new instructions about

such matters during the last nine or ten years, and on his saying that he had not, he told him that about that length of time ago his professional association (now the Institute of British Photographers) had successfully contested a similar demand. A photographer had been surcharged six shillings and eightpence, or some such amount, and it had been refunded with apologies. On getting the authentic documents from Mr. Bucknall, the secretary of the Institute, and showing them to the official, his face was "worth a photograph." "My word," he said, "to think of the number of people I have unjustly charged." And he hung the documents up in his office, to remind himself not to offend again.

In reply to questions about his methods, Mr. Adams said that he always took sharp and softened to his liking, or to the psychology of the child, on the print, having a fairly good memory and considering that 95 per cent of a child's portrait should be psychology. The psychology, too, should be wrapped up in everything—in the print itself, in the mount, even in the signature, which should be written harder in the case

of a "hard" child than in the case of a "gentle" one.

He did not like, personally, a print that was too warm in colour. His idea of a print in colour was that the colour should not be describable; it should be impossible to say that it was black, or saffron, or anything else. The colour of the print should be subordinate to the picture on it. He found that, for reasons not easily appreciable, some negatives yielded a far better colour print than others.

He could not use a photometer, because he "had not the brains," and he could not use a miniature camera because he lacked the skill. He relied to a great extent on intuition. His friend, Mr. Bertram Park, who always uses a photometer, said to him once, "You know, Adams, I should have given double that exposure for that," but when the negatives were seen, as Mr. Park agreed, they gave him all that he wanted in the print. He was guided a little by the aperture at which he was working, and he balanced up the whole thing. Sometimes, after he had got the subject in focus, the sun would come out, in which case he would simply put in a smaller stop, and if the sun went in again he would take the stop out. He

most of all a governable that "shuts immediately you not one that dragged to open gged to shut. If he had to put a dragging at all, he would a shutter with a dragged open- her than a dragged closing. ease of children this quickness ecially necessary, because of elihood of movement of the ll the time. Indeed, he said he could not draw a child's e would have to discard the art of his work.

f Thanks

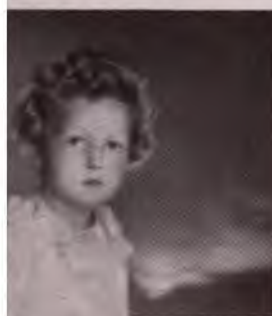
Adams's brief talk was d" by the handing round of a number of child portraits n country homes), which were admired, and on the proposi- the CHAIRMAN a hearty vote ks was conveyed to him for an ning and instructive evening. of these prints are here ced.



The Grandson



At the Piano



The Newcastle Portrait



Boy with Rabbit



Ready for Bath

SOME ENGLISH TREASURES

A Record of the Work of the National Buildings Record and the Central Council for the Care of Churches.

By Dr. K. K. Drury, A.R.P.S.

An interesting lecture on the work of the National Buildings Record and the Central Council for the Care of Churches was given by Dr. K. K. Drury, A.R.P.S., at the Joint Meeting of the Leicester and Leicestershire Photographic Society and The Royal Photographic Society at the Waterloo Hall, Waterloo Street, Leicester, on March 31st, 1942.

The Chair was occupied by the President of the Leicester and Leicestershire Photographic Society, Mr. E. Tyler.

Dr. Drury, who is the Honorary Secretary of the Leicestershire Committee of the National Buildings Record, said:—

I WISH first to speak briefly of the work of the National Buildings Record and the Central Committee for the Care of Churches. The C.C.C.C. has been in existence for some time. It is part of the organisation of the Church of England, and exists to collect records of our churches so as to advise in restoration enlargements, etc. Naturally, since war started and wanton destruction faces our historic buildings this work has been of added importance. Many appeals have been made for assistance in collecting records, photographs, drawings, etc., of the churches, great and small, throughout the land.

A little after the war started the Government felt the need for a central body to collect records of all historic and noteworthy buildings, domestic and secular as well as ecclesiastical. They therefore got the Master of the Rolls, as titular head of the Records, to call a meeting of those interested, the outcome of which was the National Buildings Record. This consists of representatives of the Archaeological, Architectural, Photographic and other learned societies, bodies and interested individuals. The N.B.R. works in close collaboration with the C.C.C.C., and their object is to see what buildings are worthy of record, what records exist, and to provide new records where necessary. As there was a deal of overlapping of effort, these bodies have endeavoured to get County Committees formed to ensure that all areas are adequately covered and to enlist local talent, uncover old records and ensure economy of working. Such a Committee has been formed in Leicestershire under the Presidency of the Lord Lieutenant, Sir Arthur Hazierge, the Vice Presidents being the Lord Mayor of the City, the Chairman of the County Council (Sir

Robert Martin, the Lord Bishop of the Diocese, and Mr. William Keay representing the Architects. The working committee includes two representatives from this Society, three architects, two archaeologists, with myself as Honorary Secretary.

So far a great deal has been done. Mr. Keay, at the request of the Ministry of Works and Buildings, got together a panel of architects to cover the county and list the buildings therein that were considered worthy of record. This list has been our foundation stone. We have unearthed a great mass of records from various places, and these are being sorted, collated and placed under the appropriate headings.

The George Henton collection of photographs, now the property of the Leicestershire Archaeological Society, has formed a great fund of knowledge. Mr. Newton's vast collection of photographs has also ably increased our assets, together with the collections of Dr. Rothesay Stewart, Mr. Attenborough and the Museum. A good many measured drawings and plans have been noted by the architects and others, and there are various drawings and sketches available. The photographers of the county have also come to our aid, though not as freely as we would have liked, but nobly in some cases.

Mr. Bedingfield has been indefatigable, and has made records of some fifty three churches. Mr. Fathers has done some wonderful work in the city churches, whilst others have assisted in excellent surveys of individual churches and buildings.

My committee are making a preliminary printed record of the work so far done, but much more is needed, and it is in this direction that I seek your aid. One item alone illustrates my point. A few photographs

exist of the north side windows and walls of the churches. The reason is easy to see. The south side is so easy with the sun on it, the north side is so much the reverse with the light against one. Much is also missed because in many cases the photographer has little knowledge of the detail he sees. May I quote myself as an example? Though I have long had a liking for architectural detail, and had, in fact, between 1907 and 1912, made quite a collection of slides of church towers and steeples—alas! a great war casualty—I did not have any real knowledge of even the outlines of architectural and archaeological knowledge. It was only when I became Secretary to this Record Committee I thought I had better know something of the terms at least used by my learned Chairman, Mr. Lovell, F.S.A., and his equally learned confrères. There are masses of literature on all aspects of the work and most of the authors appear often to give a slightly different name and description for the same object. That probably is only to confuse the learner and make the mystery the more profound!

I have therefore got together some slides to show you, and ask you to come with me for a short tour of some of the parish churches to see what may be seen. If one has some slight knowledge of what there is to be looked for, the photography of the subject becomes so much more fascinating, and since I started I have found much of great interest, giving great mental satisfaction. The subject is so vast that I have confined myself to parish churches, leaving out the cathedrals, priories, and secular and domestic buildings.

The slides I hope to show you have been very kindly lent me by the C.C.C.C., the Leicester museum authorities and Mr. Fathers.

Leicestershire is unfortunately not so richly endowed with churches of merit as other counties, our close neighbours, for instance, Northamptonshire and Rutland, both full of interest, but nevertheless there is much of merit and beauty.

Most of our parish churches were built before the Reformation, few since. What few there are are mostly in the cities and other centres of population, built to make provision for the increasing density of the urban districts.

First let us examine the plan of the church and see how it has evolved.

The early Saxon church was usually wood and wattle, and consequently has ceased to exist from the ravages of time. Only one early wooden church remains, that at Greenstead, in Essex, and it has been

much restored as well as enlarged.

The later Saxon church was usually stone built, and consisted of a small rectangular building with a narrow opening in the east wall leading to a small semi-circular or rectangular chancel or sanctuary. These churches were mostly on the north side of the hamlet or village, often near the manor house, and usually on the north side of the burial ground, as it was considered unlucky to be buried in the shade of the church.

The next step in evolution consisted in enlarging the chancel and usually the archway thereto. Then the nave became too small, so side lean-tos were made, piercing the walls with arches and making thereby the aisles; or else transepts were formed to the north and south. Later, often the aisles and transepts were enlarged to the east, making the church again a large rectangle with a row of piers and arches down both north and south sides. To provide more light, the nave, and at times the chancel walls, were raised and a series of windows provided above the level of the aisle roofs—the clerestory. Side chapels, porches and vestries were added as required.

This then is the principle on which the parish church is founded, and it can be seen that we will find churches in all stages of this evolution and containing, therefore, fragments of all ages from the date of the original foundation. Some churches, it will be observed, were built *de novo* on the plan and have remained much the same, as at Kegworth. Often they have been enlarged piecemeal, whilst others have been pulled down and rebuilt.

This evolution of the church was brought about in two ways—firstly, the increase in the numbers of converts and in the population, made larger churches necessary; secondly, the advance in engineering and architectural knowledge made it possible.

The straight stone lintel supported on piers made windows and arches small and the walls disproportionately thick. The Romans evolved the rounded arch with keystones, giving greater strength but needing massive centerings when building large openings. Gradually the art of making large arches and windows with lightweight walls became established, and from what must have been dark gloomy caverns, lit only by slits in the massive walls, emerged the pre-Reformation church of large windows, delicately glazed in glowing-coloured glass, supported by a minimum of stonework, itself a masterpiece of the stonemason's art. Stratford-on-Avon is a magnificent example.

Our Victorian archaeological ex-

perts had great delight in tracing this evolution and labelled each successive phase to their own satisfaction, but the experts of to-day apparently recognise that definite date labels are impossible when the difficulties in travel, the distances and the dearth of desirable materials in certain districts are recognised.

All things considered, it is a wonder that the evolutionary plans were so widespread, and so similar in far-flung areas.

The windows and arches apparently give the clue to most of these changes.

The Saxon types were short, narrow and round-headed. Windows had a narrow splay outside and a wide one inside. The opening was small, glass being non-existent.

The Norman types were, though small, larger, still round-headed, and arches being supported on massive pillars, doors showing many recessive "orders." There was much more ornamentation and light. Glass was coming into use, and in consequence the conditions inside must have been more pleasant. This Norman phase appears to have lasted till about 1140. From that date till about 1170 changes to the Gothic style from the Romanesque were being made. This stage is commonly termed the "Transitional." There is confusion of styles to be seen, but chiefly the emphasis appears to have been on less ornamentation and greater use of mouldings with arches and lancet windows in groups of two or three.

From about 1170 to 1260 the first



Kirby Bellars Broach Spire :
one of the finest in the country

K. K. Drury,
M.D., A.R.P.S.

phase of the Gothic revival is to be noted, the Early English, with consistently lighter work in all directions—lighter and more pointed arches—lancet windows in groups in the same framework.

The history of the period is chiefly written in the windows. The lancet became broader and the individuals of groups closer together. The solid masonry between windows was pierced with various shapes. At Kilworth there is a notable range of paired lancets with plate tracery at the heads and detached shaping in the jambs. Later, stone mullions took the place of the solid masonry heretofore found. It was a period of great activity throughout the country, from simple enlargements of windows to active enlargement and rebuilding.

The next period extended for only some fifty years—1300 to 1350—and was termed the "Decorated," and is characterised by a great exuberance of ornamented detail, at its best magnificent, at its worst just plain bad!

It was a period of great experiment in vaulting window tracery and construction generally. The whole church was showing a tendency towards becoming a stone framework for its windows and its carved features. The western end of Gaddesby is perhaps the best example in Leicestershire. Ball-flower ornaments, crocketed pinnacles and spires, arches and windows. Flamboyant tendencies, curvilinear forms and the rest, to be found everywhere. Piers and arches were nevertheless simpler and more graceful, but tombs, fonts, tabernacles, sedilia and Easter sepulchres made up in richness any lack in the archings. The west end of the south aisle at Gaddesby is the best example in Leicestershire of this type.

Windows in many churches show the same forms, probably due to the fact that centres were formed in certain places to work the stone which was brought to the site ready fabricated.

But in the height of its development this phase was cut short by the Black Death of 1348-9, which in two years carried off a third of the population of the country. In every direction work had to cease on account of the shortage of labour. But we must always be thankful that this stringency did not warp or spoil development. Far from it, for the "Perpendicular" period that followed—nearly two hundred years to 1535—gave us the culmination of the true English development of the Gothic.

Shortage of labour made stone scarce; hence lighter and larger windows. Difficulties in glazing the flamboyant and decorated styles of window gave the simpler and more

graceful forms of the period. Then the artist in glass came into his own, and churches were large and airy buildings of glass, supported by light stonework, blazing with the most subtle and brilliant colours—an art that appears to have been lost.

The shortage of skilled stone-masons gave also the woodworker his chance. The magnificent examples of screens, benches and roofs that still happily remain give us proof of the good taste and manipulative facility of the woodcraftsman.

The Reformation ended this period abruptly, and during the next 130 years, though there was some building and rebuilding, there was more desecration and destruction.

The next period is that of the English Renaissance, and to the Great Fire and Sir Christopher Wren we owe the masterly development of the style. But outside the cities there was little done, and I do not think Leicestershire owns any examples.

A few words about the fittings and accessories may be of interest, and tower, spire and steeple are naturally the first to be examined.

Some eighty examples of Saxon towers remain. They were relatively high—70 feet or more—rough-hewn and often with light pilaster strip. They were probably more of use as watch-towers than for bell-hanging, and were situated at the western extremity of the church.

The Anglo-Norman tower, on the other hand, was shorter, much more massive, with occasional tiers of arcading. There were no spires, but an occasional stumpy short tile-covered central spirelet—to throw off the rain from the upper roof. They were central in position or at the west end of the church. In the 13th century the spire and tower became part and parcel of the same construction and design. The broad spire was perhaps the supreme achievement of the age.

Of all the building designs, those of the spire and tower appear to be the most localised, large areas tending to one type, others to another, and so on.

The subject is one of never-ending delight, be it the stumpy fifty-footer of Sall, in Norfolk, the panelled richness of the Somerset fraternity, or the soaring delight of the Boston Stump.

Leicestershire can boast some of the best examples of the broach—St. Martin's; Kirby Bellars.

The Renaissance style pleases some—not so others; but its airy lightness must for ever impress, especially when seen amongst the heaviness of the commercial buildings in London—even the ruins!

The porch has always been of special significance in church history.

It was one of the chief glories of King Solomon's temple. It played an important part in many of the church ceremonies in England. Parts of the rites of baptism, marriage and burial started in the porch—usually to be found on the south side of the nave. With the porch, the doorway, door and its ironwork are all of interest. Norman doorways are still numerous, and many have been moved from site to site with the successive widening of the body of the church, though every rebuilding means more and more restoration work.

Porches were often two-storied, and occasionally three-storied; giving living space for the priest, or watchman, storage of arms, records, or place for the church school.

Gargoyles and grotesque carvings appear to me to be difficult to reconcile with church atmosphere, but in few other buildings do we meet with such a collection of curious beasts, demoniac faces and other contorted figures. The medieval love of the grotesque had full play here, and the individual craftsman had full play for his fancy and powers.

Gargoyles are spout heads—the original roofs shed their rain direct. Later the parapet appeared, which made it both safer to get to the roof and easier to collect the rainfall into safe channels that did not threaten the foundations. The spouts from these gutters gave an excuse for the grotesque that is to be seen in all districts; there is a remarkable array of this in the Mendips and in Lincolnshire. There are some fine examples at Gaddesby and Melton.

Though stone vaulting occurs in parish churches, it is comparatively rare except in the porches and towers. Fine examples of lierne work occur in Bristol and Nantwich. There is at least one example of a north aisle with stone vault in Leicestershire. The wooden roof in all its forms is, however, the usual parish church roof. There are numerous types, from the plain beam, the coupled beam, to the single and double hammer beams.

The Leicestershire roofs are not noteworthy, being usually of the plain type with an occasional barrel roof.

So far I have mentioned chiefly—briefly and inadequately—the structural features, but there are other features—the fittings—that are of equal interest.

Fonts there are of every type and shape, on every kind of support. Sometimes ancient bowls on later period stands; carved and plain bowls; cylindrical; cupped; rectangular and many-sided. There are still five of the noted black Turnai marble fonts—these in Hampshire.

Font covers are of interest. They

introduced to keep safe the water for those who desired to use it for purposes of black magic or of the demoniacal arts.

Some of these are plain, others are of the finest woodwork, and early to the roof, with their gables and arches.

They also exhibit fine examples of carving of all ages. There are some pulpits in existence, and some are usually elaborately

On the south wall of the chancel in the older churches are to be found sedilia, usually triple, occasionally double or single. They were made of stone for the priests, and ornamented in many cases by the finest carvings and ornaments. Of the later period there are many examples of the most intricate work, many of the smaller and older sedilia exhibit very plain niches in the thickness of the wall.

On the east side of the sedilia, often in the south walls of the chancel and aisles—occasionally elsewhere—is to be found the piscina, a stone basin with a drain, where the holy vessels were washed. Again they are of various shapes and decorated.

On the north chancel wall on the north side is often to be found the Easter screen or richly canopied recess—usually of the fourteenth century or later. The altar Crucifix and the Host on a plate from Good Friday to morning.

On the north chancel wall is often to be found the aumbry or niche with doors for the holy vessels were kept. In older churches doors are now few in number. There are few of the original stone aumbries left now—most were thrown away at the Reformation, to be replaced at first by a wooden table, and later of the Jacobean type. That is a magnificent example. The aumbry also came in for destruction at the Reformation—especially where the finest and most work was done—rows of saints' niches—the Last Supper and other sacred subjects.

Woodwork much more should be mentioned. I can only call attention, however, to the pulpits and font covers, the panelling of pews, screens and so on. At Misterton are fine examples, and the shape of full-sized cockscuttle. Subjects found vary in profusion—fine plain relief to representations of crafts and trades.

Many pews are to be found—some even with a fireplace to keep the people warm.

If all the woodwork none is to be compared to the screen. Though even with rood loft were ordered

to be demolished at the Reformation, and many were demolished, many examples remain, though few with the rood. The screen is again having attention, and a fine example of work happily and beautifully carried out by the Birmingham Art Guild is to be seen at Sibson, in the south-west of the county.

Ironwork is chiefly to be noted in hinges and an occasional bracket for the hour-glass near the pulpit. Ironwork gates, doors and screens are chiefly found in the private chapels dividing them from the main body of the church.

Tombs and monuments form one of the great attractions in our churches; they make history real,

give life to our ideas of people, and illustrate clothing and customs so clearly.

The earlier are austere and plain, the latter elaborate and often magnificently coloured. The restoration of the tomb of the Black Prince at Canterbury must be seen to appreciate its beauty and fascination. There was a great centre at Nottingham where alabaster workers performed their craftsmanship with marvellous precision and probably with great fidelity where a likeness was the object.

The Reformation did not end this craft, and there are several examples of the later styles in Leicestershire, notably the nearly life-sized equestrian



Noseley—the Hazlerigg tomb of Sir Thomas Heslrig, 16th January, 1629, and of Dame Frances Heslrig, showing their eight sons and six daughters

K. K. Drury,
M.D., A.R.P.S.

trian group, by Rysbrach, of Col. Cheney, at Gaddesby.

Monumental brasses are another source of information on contemporary habits and orders. Some are extremely ancient, some are large, some quite small, as at Great Bowden, where there is one only some fifteen by three inches—alas! broken when being dug up—one that proved to be a palimpsest, the obverse showing a knight in Flemish armour and dated c. 1350, the reverse being an inscription about a parish priest, the Rev. Wolstanton, dated 31-8-1403. This is now safely housed in an oak frame attached to the chancel arch, so that both sides may be seen.

The picture given us of the interior of the pre-Reformation church was one of light and colour. Colour from the magnificent glass as well as from the coloured paintings that, beside

enlivening the scene, gave instruction to the usually illiterate church-goer.

Over the chancel arch often was a painting of the Doom or Last Judgment. Several remain, the finest at Salisbury St. Thomas, but that at Lutterworth is also a good example. Over the inner north door was often found a painting of St. Christopher with the Child on his shoulder—the patron saint of travellers. The paintings were covered or scraped off at the Reformation. The plaster has been removed, and now we have the cold stone left in most cases.

Two last points of interest—squints and low side windows.

The former or hagiostopes are openings through the chancel arch, said to be there to enable the priest at the side altar to synchronise his movements with those at the high altar. There are numerous examples,

from the plain rough opening elaborately made with arc mouldings.

Low side windows, often partially blocked up, form a puzzle usually situated in the south of the chancel near the west door. They were once thought to have provided a means for lepers and not allowed in church to see the altar, but now they are considered to have allowed a watcher to see the elevation of the Host to work the side.

My address has been disjointed and superficial; much of necessity to be omitted. Volumes in the series have been written on the subject, doubtless many more will be written, but more are wanted. If I have given a lead to a fascinating subject, I am satisfied.

FILMS FOR RESEARCH

ON November 10th and 24th, 1942, the films entered for the Exhibition, entitled "Photography in Science and Industry" were shown at The Royal Photographic Society's House, at 16, Prince's Gate, S.W.7. The Exhibition was organized by the Association of Scientific Workers, and the films were numbered 277-282 in the catalogue of the Exhibition.

Two of the films were made by the L.M.S. Research Laboratories and showed investigations carried out by the Engineering Section to determine, in the first film, the effects of various wheel tyre profiles on the smoothness of running of trains, and, in the second film, wheel-slipping experiments to study the dynamic balancing of locomotives. The former was also shown by Mr. E. D. Eyles to illustrate his talk, given on November 6th, on applications of high-speed photography. Both films were in slow motion, a camera speed of sixty-four frames per second having been used. In the first, a close shot of the carriage wheel running on the rail was taken by means of a periscope working from the compartment above, a time-base being provided by a flashing lamp. The varying frequency and amplitude of the transverse oscillation of the wheel with different types of tyre profile could be seen in the film. An ingenious device using a projector with a moving paper screen was employed for recording the oscillations as an amplitude-time curve. In the wheel-slipping experiment the rails were oiled so that wheel speeds equivalent to engine speeds of over 100 miles an hour could be used while

the engine itself was almost stationary. The behaviour of the various types of engines depended on the balancing of the masses of their reciprocating parts, and the most suitable ratio was determined from the film. Unsuitable types bounced badly on the rails, leaving them kinked and bent.

The third film, also shown by Mr. Eyles, showed the use of high-speed photo-elastic analysis in estimating the stresses in a moving engineering part by making a transparent model and photographing it between polarizing prisms or filters by means of the high-speed cine camera. Photo-elastic analysis had been utilized for some time, but it was only recently that the obvious advantages of the use of the cine camera for

moving models had been realized. It was easy to see from the film that one would fit up a similar experiment to investigate other moving parts.

Three films were contributed by the I.C.I. Film Unit. The first of these, entitled "Concerning the Crystal," showed the "marriage," by chemical means, of two crystal forms to produce the ideal intermediate form of crystal. The second, which was a clever coloured cartoon, showed elementary chemistry of the synthesis of ammonia, the apparatus for (in the film) might have been designed by Mr. Heath Robinson. The third illustrated a process of fabrication of denture bases from a plastic known as "Kallodent" in place of vulcanite. In this last too much was left to the imagination of the beholder: there was little explanation.

TECHNICOLOR CINEMATOGRAPHY

The *Journal of the Society of Motion Picture Engineers* for August, 1942, records a paper by Mr. W. Hoch on "Technicolor Cinematography," which presents some of the aspects that are peculiar to or receive emphasis from the fact that the camera is photographing in colour. Of all the preparation activities that take place before the actual start of photography, two that are very important to the technicolor cameraman are colour design of the sets and costume colour selection. The importance of proper colour design and costume colour selection cannot be over-emphasised.

Other important items to the cameraman are his lights. The article deals with the important factor of

colour temperature. "Our three-strip technicolor camera is balanced to an average daylight colour temperature. For true reproduction, especially in the shades and neutral greys, this temperature should not vary on the average by more than about $\pm 250^\circ$." Light sources used for photography might be classified in four groups, as follows: daylight; intensity arc light; white-fluorescent light; incandescent light. The light is, of course, our standard for colour temperature, and are balanced for exterior interiors. The colour temperature factor is once more important when reflectors are extensively worked.

PHOTOGRAPHY AS A TOOL

By D. A. Spencer, Ph.D., F.I.C., Hon. F.R.P.S.

in such circumstances, words are only of value in describing things to the blind, and the phenomena of nature should not be described in words when they are such that they can be apprehended by the eye."—LEONARDO DA VINCI.

THE who has visited this exhibition* will not be persuaded of photography's versatility, and the usual type of lecture in which the point is hammered home by brief descriptions of a miscellaneous range of applications in different fields hardly seems

Perhaps a more useful purpose will be served by attention to points which should be watched in proposing to use photography as a tool, using as illustrations applications which are not well represented in the exhibition, and concluding with a selective reference which not only illustrates the diversity of applications made, but will guide students in different techniques which have been successfully used.

Photographs are made for the purpose of obtaining a permanent record required by "the man in the street" and the conventional "photograph"—demand a very wide variety of photographic emulsions exposed in different cameras. Photography is, however, tending to be used as an instrument for scientific work. Spectroscopy and spectroscopy are now almost entirely photographic instruments, and the microscope is rapidly being replaced. Moreover, the ability of the photographic process to record events too transient or too faint to be visible to the eye, and its greater power has led to the development of a large number of special "cameras" and of over one hundred different types of photographic emulsion.

However, the value of photography as a means of recording data is only fully realised by a limited number of scientific and technical workers, and only two attempts to extend its use in new directions are made by ignorance of the characteristics of present-day photographic processes.

It may be due to the curious fact that, with a few rare exceptions, photography is rarely considered a suitable subject for pure research. It will probably be the last of the great inventions whose application in an industry was very largely an empirical matter and whose greatest triumphs were explained only after they had become accomplished facts. In its early days it was a rather messy hobby whose raw materials and methods were evolved by amateurs. For the past few years most of the research on the process has been undertaken by the photographic manufacturers, and many objects have naturally enough been the result of the manufacturing process. This has been spanned, however, by a growing understanding of the photographic process, and it now has its own terminology and an instrumental technique of its own.

In recording work, involving only qualitative measurements or examinations, a general knowledge of the properties of sensitive materials and the methods of their use is all that is normally required. In quantitative work, however, a thorough understanding of the properties and limitations of the photographic process is important if results are not to be misinterpreted. This is especially true in any work

involving measurement of light intensities as in spectroscopy and astronomical work. The publications listed in the appendix deal in detail with characteristics of the photographic process which can only be mentioned here.

The greatest opportunities for misunderstanding and misuse naturally arise in the "Plasticine and Meccano" stage of a research, where photography is being pressed into new uses with prototype equipment, and it is here that the research laboratories of the photographic manufacturers willingly perform a most valuable service. They are in the best position to advise on the possibilities and limitations of photography in any particular connection, to indicate the most suitable of the hundreds of different sensitive materials available, and often their libraries can provide valuable references to earlier work of a related character.

Even, however, when a new technique becomes established as an industrial tool and the associated apparatus arrives at the "crinkle finish and chromium plate" stage, it is surprising how frequently ignorance of the photographic side of the technique results in the apparatus working at reduced efficiency if not actually producing misleading results. Difficulties which cannot be resolved by the makers of the equipment should then be referred to the "service departments" of the photographic manufacturers which exist to ensure that the best use is made of their products.

Characteristics of the Photographic Process

The eye is by far the most important gateway to knowledge in scientific and technical research, and in nearly every branch the work is so designed that the final observation employs the sense of sight. Photography, besides being the only means available of recording in essentials all that the eye can see, can in many ways operate efficiently under conditions where the human eye is helpless, either because the light is too bright, too faint or too transient to see by, or because the radiation of interest does not give rise to vision. The nature of the photographic record is determined in part: (a) by the nature of the optical system employed to produce the image; (b) by the nature of the particular type of photographic emulsion used, and (c) by the manner in which the emulsion is processed and printed.

As regards (a), two valuable innovations which have been too recently introduced on a commercial scale to have found their way into textbooks are the coating of lens surfaces with monomolecular layers of fluorite, etc., which results in a marked reduction of scatter and flare of light in the image of subjects hitherto prone to these defects, and the introduction of new varieties of optical glass with remarkably high refractive indices and low dispersions. The combination of these features has already yielded high aperture lenses of remarkable performance and yet relatively simple design.

As regards (b), emulsions are available for recording radiation ranging in wavelength from 0.001 Å to 13,500 Å—covering γ rays, X rays, Grenz rays, ultra-violet, visible light and infra-red. In addition, high energy quanta, electrons and other subatomic particles all produce permanent records in suitably chosen emulsions. Although emulsions have been prepared capable of

* "Exhibition in Science and Industry." Exhibition organised by the Association of Scientific Workers, and held at The Royal Photographic Society's Premises, in November, 1942.

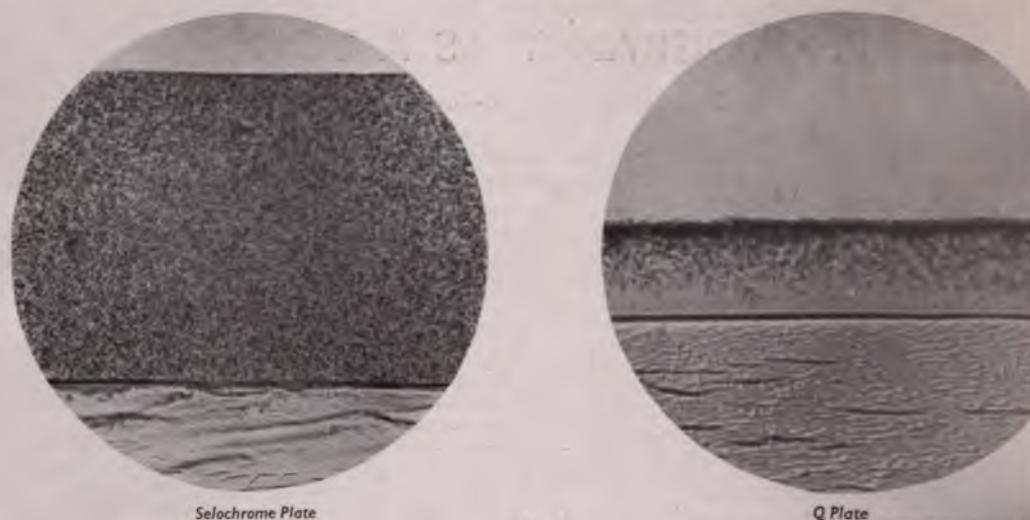


Fig. 1

Q Plate
Courtesy Ilford Ltd.

Photographic material is now available to the scientific worker in many specialised forms.

(a) Section through a normal photographic emulsion before processing.

(b) Section through emulsion designed for recording subatomic particles moving at slow speeds.—The silver halide is concentrated in the surface layers and the effect of the gelatin matrix in stopping the particles is therefore minimised.

recording radiation of all wavelengths from 2,200Å to 9,000Å, generally speaking it is preferable to choose material specially sensitised for the wavelength region of greatest interest (10, 11).

Working Speed

The working speed of any particular emulsion depends upon the circumstances of its use. The effective working speed is determined in part by the characteristics of the emulsion, the composition of the developer, the time of development, the duration of the exposure, the intensity of the exposing light and its wavelength. These factors all combine to render photographic photometry a subject full of pitfalls for the unwary. The necessary conditions to be observed for reliable results have, however, been clearly outlined on several occasions (6). In all other work, the working speed of the photographic material given by its manufacturer is a sufficient guide except, perhaps, at very high or very low intensities. Generally speaking, every class of worker is well advised to choose the slowest working material that the conditions of use will permit.

Resolution

All photographic emulsions are granular, the individual crystals of sensitive silver halide being of the order of one micron in size. As a general rule, the faster the emulsion the larger the grains of which it is composed, and consequently the graininess of the metallic silver image which is the end product of the photographic process is greater for the faster materials than for the slower ones. The graininess of the very fastest materials is just about detectable by the unaided eye. In any given emulsion the graininess can be varied somewhat by different choice of the processing methods adopted, but at the expense of the speed of the material and even, sometimes, at the expense of the resolving power.

Although, in general, the materials with high graininess have low resolving power, the relations between these two properties are not at all simple, and when an optical system is involved are still more complicated. Cases are known, for instance, of fine-grain emulsions

giving worse resolution than coarse-grain ones. An optical system is a good one and the emulsion a poor one, the resolution may be regarded as determined by the emulsion, and we may expect resolving power of order of 20 lines/mm. If, on the other hand, the emulsion is one specially designed for very high resolution, the limit which may be in the neighbourhood of 1,000 lines/mm. will be set by the optical system employed. Finally, the resolving power of an emulsion varies with the wavelength of the exposing light, changing to shorter and shorter wavelengths in the violet increases the resolution.

Processing

The importance of careful development is frequently overlooked. Those new to the operation are well



Courtesy R. G. Hopkinson and General Electric

Fig. 2

Perfect photographic technique is essential when using photographic material for photometry. Points of equal brightness on the surface are recorded as equal densities on the photograph.

a few lightly and uniformly fogged plates or examine the result over an illuminated opal plate like. Not until critical inspection reveals no variation in the density of the deposit is a satisfactory technique being used. Development times of five or longer are more satisfactory from this point and are usually regarded as essential in photo-colour separation work, where the densitometer would replace the eye when assessing the quality of development and standardised treatment material in fixing, washing and drying also assumes importance.

Photography as a Tool

In speaking, the advantages of photography as a

scientific tool depend upon the following characteristics (1).

- (1) Photography produces a permanent record of a phenomenon which may be examined at leisure and kept for future reference.
- (2) Photography enables records of movement to be speeded up or slowed down so that the movement can be observed at a speed which the eye can see and the brain comprehend.
- (3) Photographic records can be made of light intensities too low to affect the eye.
- (4) The photographic emulsion can be rendered sensitive to radiation far beyond the range of the visible spectrum.
- (5) The photographic emulsion is sensitive to subatomic particles moving with high velocity.

Characteristic examples of each of these classes will be found in the exhibition. There are, however, a few applications of which we either have no example or whose full significance will not be obvious from the exhibits available, and I will refer briefly to some of them in illustration of three of these classes.

I.—Records

In the mere fact that the photographic record can be made smaller than the original we have the subject matter for a long book, for new applications open up almost daily. The "Airgraph" scheme—direct descendant of Dagron's pigeon post from beleaguered Paris—has made one advantage of micro records obvious to the general public. But for several years now the implications of the fact that records can by microfilming be condensed to three per cent of their original space have been growing in significance. The release and saving of valuable storage space, protection of irreplaceable records against loss by war, accident or theft, and the increased availability are obvious advantages of which banks and big business houses are making growing use. U.S. public documents can now by law be thrown away if miniature film copies exist. One machine tool firm which had nearly half-a-million drawings occupying 1,500 square feet of floor space has now microfiled the lot in two drawers of a letter file. Libraries, which began by storing the contents of newspapers in this way, are now extending the method to their books. All English books in the British Museum written before A.D. 1,500 have been recorded in this way, and the Library of Congress offers a service of microfilms or positive enlargements of any part of its ten million volumes. Such reproductions serve the student just as well as the, often irreplaceable, originals. This technique has also been suggested as a means of dealing with the problem of publishing and distributing those scientific papers which are too specialised or transient in interest to justify printing in full in the ordinary scientific journals.

Miniature radiography is my final example of the potential value of micro-photographic recording. In X-ray examination we possess the most important of all tools in the fight against tuberculosis, and it has long been recognised that if it were possible to make periodic X-ray surveys of the population we could by early detection reduce mortality in the immediate future and take a big step towards stamping out the disease altogether. By making miniature photographic records of the fluorescent image on the X-ray screen the difficulty and the cost of making such surveys has been so reduced that this technique is about to be introduced on a wide scale. The only danger, as the technical committee appointed by the British Medical Council have pointed out, is that the convenience and simplicity of the technique may lead to the "hooking up" of compromise apparatus by some enthusiasts and the correspondingly disappointing results would bring the method into disrepute. A very high standard of



Fig. 3 (A)



Fig. 3 (A). Fluorographic Camera. Stamping out tuberculosis is no longer a dream now that miniature photography has been properly harnessed to X-ray examination. The speed, convenience and economy of the system makes mass surveys of the population practical politics. The specially designed "Fluorographic" camera shown above takes cassettes holding any length from five to one hundred feet of film. After any number of exposures, which can be preselected if desired, operation of a guillotine closes the cassette and the exposed film can be removed in daylight. Devices preventing double exposure, the making of unidentified exposures or exposing in the absence of film, are incorporated.

Courtesy Kodak Ltd.

Fig. 3 (B). Strip of 35 mm. film carrying miniature radiographs.

Courtesy Kodak Ltd.

Fig. 3 (B)

MINIATURE RADIOGRAPHY



Fig. 4. Detection of Small Changes in Complicated Set-up

A positive transparency from a negative made before the change occurs is registered with a negative made from the same viewpoint after the change. The print from this combination is shown in (C). The fact that the model has been moved can be seen by comparing (A) and (B) by eye. In making this change the sand has been disturbed and this is only revealed by this technique, which is employed by astronomers to detect the appearance of new stars and the relative movements of known ones.

quality in the miniature record is both essential and attainable by the use of properly designed equipment, and the films which have been produced specially for this purpose. The present function of miniature radiography is limited to the sorting of abnormal from normal chests for further examination, and the small sacrifice in diagnostic value involved in the use of 35 mm. film is accordingly acceptable. A possible future development is the devising of flexible equipment which will enable "follow up" records of mending bone fractures and the like to be made. It is not yet clear, however, whether, even with such flexible equipment, the technique can usefully be extended to industrial radiography, where the usual demand is for the greatest possible diagnostic value—visual examination of the fluorescent screen image being usually sufficient when this is not the case. It is possible, however, that miniature film radiographs will replace paper radiographs made for record purposes and, in America, small aircraft components are being examined in this way.

Detection of Movement

Given suitable conditions, photography is of considerable value in detecting the occurrence of very small changes in the shape or position of objects. An elementary example is shown in Figure 4. (A) is a photograph of a model. After the photograph was taken small alterations were made to the set-up and the model re-photographed (B). From the negative of (B) a contact transparency was made of the same contrast. Obviously, if

this transparency is bound into register with the negative of (B) the various tones will cancel each other out and a uniform grey density will result. If, however, the transparency is registered with the negative of (A), the arrangement of the objects in (A) differs from the arrangement in (B) and cancellation of tones will not take place. (C) shows the result. Although the fact that the small toy model has moved an inch or so might be obvious on comparison of the original prints, the fact that in moving the model the proportions of the sand background had also been disturbed would not be detected by eye. Astronomers may use this technique to detect the appearance of new stars in the night sky, and to discover whether what at first might appear to be a new star is not in fact a special case on the photographic plate.

The faith of the astronomer in the accuracy of the photographic record is little short of staggering. The magnitude of the magnitude, brightness, speed, composition, mass of the stars—the size of the universe itself—based upon spacial and density measurements on the photographic plate.

Spectrography

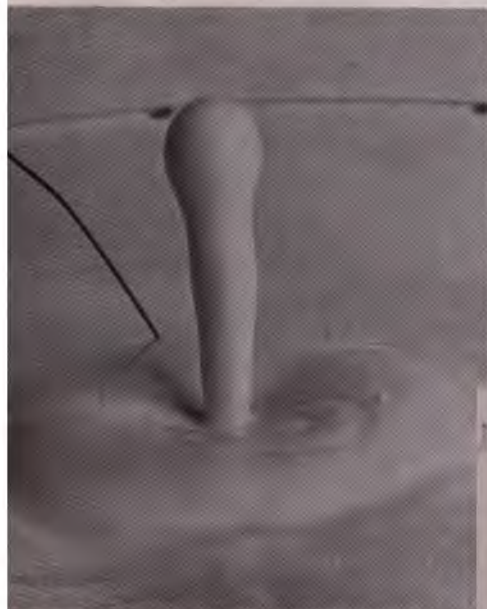
The modern method of spectrographic analysis is much to the astronomer. Spectrographic analysis is as a department of chemistry, but owing to its complexity chemists soon reverted to their older methods. The stars have to be analysed by their spectra or by the method of the astronomer's enthusiasm. As a result of the astronomer's enthusiasm many sources of error in the earlier techniques were eliminated.



Fig. 5. Spectrographic Analysis.

Equipment and photographic material specially designed for the purpose has made spectrographic analysis a reliable works technique. The evenness of sensitivity of the plate from the far ultra-violet to the visible blue is shown by the aluminium spectrum (A), while the resolution of the 3,100 triplet in the iron spectrum (B) shown in (C) is a stringent test of the equipment and photographic material.

(Kodak Slow Spectrographic Plate). Courtesy Adam H.



k 0.800 Plate

Courtesy A. L. Shuffrey

and in the last decade spectrographic analysis has become a routine works method for the quantitative estimation of small percentages of metals in alloys. As yet the method has not been widely applied in the analysis of non-metals, since the sensitive lines in non-metals (the lines which are in evidence when only slight quantities of an element are present) are shorter in wavelength than $1850 \text{ m}\mu$ and a vacuum spectrograph, a complicated and expensive piece of equipment, is then necessary. The application of spectrographic analysis to the control of alloys has been, however, one of the outstanding developments in the non-ferrous metal industry in the last decade. It has freed hundreds of youths from the boredom of routine analysis, for in a few minutes, and at a fifth of the cost, it gives a result which would otherwise involve hours of laborious work.

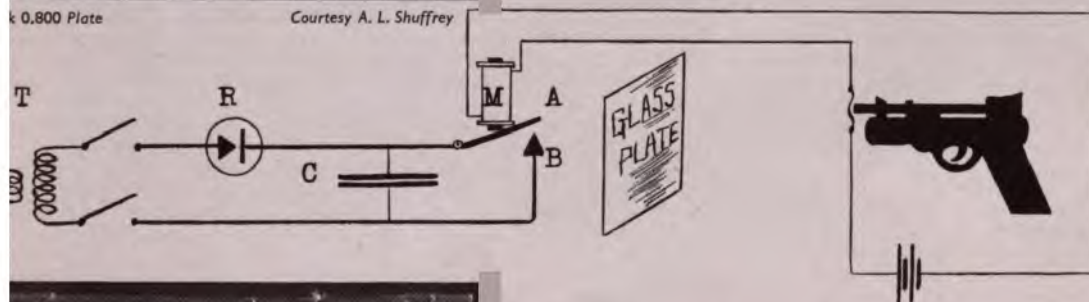
2.—Analysis of Movement

The way in which high-speed photographs help the scientist and technician is not always obvious from the

EFFECTIVE HIGH-SPEED PHOTOGRAPHS OFTEN REQUIRE INGENUITY RATHER THAN ELABORATE EQUIPMENT

Fig. 6 (Left). The surface wave produced by a falling drop was used as a trigger to "catch" a record at any stage in the history of the splash

(Below). All the components of the spark circuit used to record the bullet at the moment of impact with the glass were obtained from a radio junk shop at a total cost of 15s.



k 0.800 Plate.

ns

Courtesy
A. W. Spencer

The condenser C consisted of a bank of six old telegraph condensers connected in parallel, having a total capacity of 72 mfd.

The mains current is transformed to 800 volts by the transformer T and then rectified at R, which can be either a valve or a metal rectifier

When the pistol is fired, the bullet cuts the wire which is fixed across the muzzle. This releases the electromagnet M, thus allowing the sprung armature A to meet the contact B

A brilliant spark occurs when A and B are almost touching. The duration of the spark is $1/20,000$ th of a second, and enables a sharp photograph of the breaking glass to be taken

By adjusting the distance of the pistol from the glass plate, or by adjusting the tension on the armature spring, a series of photographs can be taken of different glass plates in progressive stages of disintegration

spectacular pictures usually selected for exhibition purposes. It is interesting, of course, to see a jet of soda water, a sneeze or a ballet dancer caught in mid-air. The present exhibition contains, however, some excellent examples of the technical value of high-speed photography and cinematography and of the ability of the time-lapse camera to speed up movements, such as growth, to a point where they become significant.

Workers in the field of high-speed cinematography have pointed out that more use would be made of the "time microscope" if technicians realised that its value is not limited to studying the performance of complicated high-speed machinery. (E. M. Watson, *Machinist*, 1941, p. 500 E). The "time-distance" graph of motion provided

by this technique gives equally valuable guidance to the design and performance of relatively simple and slow-moving machines such as hydraulic presses.

Again, however, it should be pointed out that mere possession of the equipment is only half the battle. An understanding of its limitations is as necessary as of its advantages if the results are to be of value. Broadly speaking, high-speed cinematography is best suited to a study of parts having an opportunity of fairly large motions. When the "movement variation" to be measured is only of the order of a few thousandths of an inch the field of view must be limited to approximately half-an-inch, but depth of focus problems then become serious. As a general rule, accurate measurements of deviations from the ideal movement of a part require that such deviations amount to more than $1/100$ th of the diameter of the picture field—regardless of the dimensions of the actual moving parts forming the field. Remarkable ingenuity has, however, been shown in overcoming such obstacles in individual cases, and a lecture by an expert on the subject forms part of this series.

3.—Sensitivity to Radiation other than Visible Light

The scientific applications of photographic records by invisible radiation are well represented in the exhibition as regards infra-red. The various forms of radiography are far more important, however, and it is a pity that this section is not larger. An interesting exhibit could have been built up to show how by a variety of techniques the structure and characteristics of materials can be revealed layer by layer. Thus, by electron diffraction the arrangement of the outermost monomolecular layer is revealed—of importance in the study of lubrication—and other surface phenomena. Photomicrography reveals the surface as the eye sees it; X-ray crystallography will reveal the architecture of the atomic structure to the depth of a few atoms; infra-red photography penetrates thin crusts of rust and reveals, for example, the cause of porosity in tin plating; X-ray micrography, in which a pin-hole is used to canalise the X-ray beam, will also penetrate layers a few fractions of a mm. thick, and settle such questions as whether the copper in a copper-aluminium alloy is in solid solution or not, and finally the more familiar radiographic and gamma-ray techniques enable flaws and faults to be recorded, even though they are embedded in the centre of steel a foot thick.

Some of these techniques are still in the laboratory stages, others have already been harnessed as works tools as the result of the development of apparatus which can safely be placed in the hands of people almost completely ignorant of physics. X-ray crystallography is a typical example. Most solid materials are more or less crystalline, and the fundamental principle upon which X-ray crystallography depends is that the atoms of which a crystalline material is built up are separated from each other by distances of the same order of magnitude as the wavelength of X-rays. Monochromatic X-ray beams are therefore reflected or refracted in a regular manner and give rise to characteristic spectra. The first interpretation of these spectra requires, of course, an expert physicist and mathematician, but, from the point of view of non-destructive testing, the method can be used in a variety of ways by users who need no more knowledge of the physics of the subject than the average owner of a wireless set has of the physics of radio. The interpretation of the patterns produced by a modern industrial set is, in their hands, not so much in terms of crystalline structure as such as on broad but informative lines as variations in heat treatment, corrosion, cold rolling, annealing and residual stresses. The proper interpretation of conventional radiographs is, by



MOTION STUDY PHOTOGRAPHY

Fig. 7. Movements made by an operative during assembly work revealed by attaching a small lamp to the hand and making a exposure

The lamp can be filtered so that it transmits only invisible infra-red radiation to the camera. Moreover, by introducing a "saw-tooth" modulation into the lamp circuit current the direction and velocity of the movement at any point can be determined from measurements made on the photograph. If both hands are used the characteristic modulation is different for each

Courtesy Kodak

comparison, often a more difficult matter, for more is required on the correlation between X-ray findings and the actual strength of materials. Thus if, for example, ten per cent of intercrystalline porosity, i.e., the separation of individual crystals during the shrinkage which accompanies cooling—has less influence on the mechanical strength of a light alloy casting than the normal variations of properties due to differences in microstructure, then we can ignore ten per cent of porosity, and it can be thought that a technique insensitive to porosity of this order would be permissible. Present tendencies are, however, to regard radiography as an indispensable tool in the foundry during the production of new types of casting. The sensitivity to fault detection is made as high as possible, and only after the casting technique is established on a firm foundation is any relaxation in the inspection permissible. Even then, the relaxation is rather in the direction of radiographing a limited number of samples than of reducing the sensitivity of the method, and very fine grain X-ray films specially designed for industrial work have in consequence been introduced.

Education

In conclusion, I feel that the value of photography in education deserves emphasis. Unfortunately, most of us have received an education that fitted us for a world which no longer exists, and part of man's troubles are undoubtedly due to his inability to absorb technological progress as quickly as that progress is thrust upon him. Radio, with all the many forms of applied photography, are twentieth-century tools with which to tackle this twentieth-century problem. But radio is by its nature too rapid for the training of young minds, too elusive to develop lasting habits of thought, and at the best can only stimulate learning. Photography, on the other hand, can lay claim to being the one truly international language. All words are only a complicated form of thought pictures. Pictures are not only more potent in themselves, but are remembered long after the printed page or spoken word has faded from memory, as anyone who tries to recall the textbooks he used at school will probably realise. I hardly need remind you of the effectiveness of the film as a means of propaganda, though we in

only dabbled with the subject so far. Germany has a better use of the film for propaganda and purposes than we have. In peace-time her possession of 40,000 cinema projectors as against the 2,000 in English schools, and her horror film, "The Last Days of Pompeii," was used with considerable effect as a first step in the overcoming of resistance by her smaller European victims.

In America, legislation relating to child labour which was passed by a majority of States as unwarrantable interference, passed both houses of Congress following the showing of the "Time" film on this subject, while their film "The Day After Tomorrow" aroused the national conscience of America to the evils of the quackery that is a fear of this scourge.

Showing films with which we are at present experimenting are only a primitive beginning, although time on cinematograph studies are already of considerable value in simplifying the movements made by performing repetition operations.

For example, in which movement is recorded on cinematographs, is shown in Figure 7. In earlier times this technique it was necessary to make the semi-darkness, and under such conditions it is certain that the movements made by the worker are abnormal ones. Many workrooms are, however, lit with ultra-violet light which emits no infra-red. Under such conditions or in daylight, a lamp emitting infra-red can be recorded on an infra-red plate, and with minimum interruption to normal working conditions.

Further, by introducing a "saw tooth" modulation lamp circuit a discontinuous track is obtained, becomes possible, by measuring the length and frequency of the impulses recorded during each movement, to define their duration and direction in space. When the speed slows down, the impulses will be bunched and so on. When both hands are used, the characteristic modulation of the lamps attached to each hand, and it thus becomes possible to identify movements which movements are made by which the records for analysis at leisure can also be made without any psychological effect on the worker by the use of a red film and invisible infra-red flood lighting. In the factories the novice has hitherto learned his trade by passively watching an expert operative, by listening to explanations as the latter is capable of giving, by trial and error. It is, therefore, a sounder practice for training to be isolated as far as possible from production, and the operative who is not a particular job best is not necessarily the best. He may even be unable to describe what he does or why he uses them, and he may not know he employs one type of movement when he is employing another. The film is the ideal method of analysing the skill of the expert operator, and of teaching the novice. The film can also demonstrate clearly the type of errors the novice is likely to make, how they should be avoided, and how, if they do occur, they may best be dealt with, and it can repeat the often as needed and at the optimum learning speed. It does not require a very vivid imagination to see the sound, colour, stereoscopic cinema film becoming the supreme teacher and habit-former of our race, summing up in its records the experience of the whole world, so that no new knowledge is lost and no child is left to begin at the highest point of knowledge that his fathers had attained.

The value of photography becomes more apparent when the photographic industry itself increases. Every year chemists turn some 500 tons of silver, 5 tons of gelatin, 6,000 tons of cotton, and 13,000

tons of wood pulp into photographic materials. But the value of photography to the community as a whole is not so much measured by the amount of photographic material produced as by the amazing diversity of the uses to which it is being turned by human ingenuity.

This paper formed the basis of a lecture by the author, given on November 4th, 1942, at 16, Prince's Gate, S.W.7, during the exhibition, "Photography in Science, Art and Industry," organised by the Association of Scientific Workers, and held in the galleries of The Royal Photographic Society.

The chair was occupied by Dr. S. O. Rawling, F.R.P.S.

APPENDIX

Selective bibliography for the potential user of photography as a tool.

- (1) The Place of Photography in the Advance of Science. G. B. Harrison, *Phot. J.*, 1939, p. 202.
An ordered account of the reasons underlying the value of photography to science, illustrated by typical applications.
- (2) Applications of Photography to Scientific and Technical Problems. O. Bloch, *Journal Royal Society of Arts*, 1937, p. 651.
General review, including astronomy, spectroscopy, atomic physics, ultra-violet, infra-red and X-ray.
- (3) Photography Applied to Engineering. D. A. Spencer, *Phot. J.*, April, 1941, pp. 159-173.
General review, including record making, drawing office, foundry and metallurgical applications, radiography.
- (4) High-speed Photography and its Application to Industrial Problems. E. D. Eyles, *J. Sci. Inst.*, 1941, p. 175.
A comprehensive account with many references to the literature.
- (5) Photography as a Scientific Implement. (Book). Van Nostrand, New York, 1923.
Physics and chemistry of the photographic process (somewhat out of date), but useful chapters on photogrammetry, stereo work, photomicrography and forensic photography.
- (6) Role of Photography in the Detection and Measurement of Radiation. E. R. Davies, *Phot. J.*, 1942, p. 267.
Characteristics which must be borne in mind when photographic emulsions are used for obtaining quantitative records.
- (7) Photography as a Recording Medium for Scientific Work. C. E. Matthews and J. I. Crabtree, *J. Chem. Ed.*, 1927, p. 9.
Gives references to original papers by users of photography in many branches of science, including chemistry (studying rate of reaction, sedimentation, Brownian movement, cataphoresis, molecular weight of proteins, surface tension), physics (atomic physics, temperature measurement, flame propagation, mechanics of rapid movements), psychology, physiology, engineering, surveying, medicine. Practical recommendations as regards choice of materials.
- (8) National Buildings Record. Reports by Technical Committee of R.P.S., *Phot. J.*, 1941, pp. 309 and 477. 1942, p. 186.
Describes the precautions to be observed when making photographs of buildings, etc., from which dimensions are to be deduced.
- (9) The Camera Cannot Lie (?). D. A. Spencer, *Phot. J.*, 1934 p. 140.
Elementary account of some of the more obvious pitfalls when using photography as a tool.
- (10) Photography as an Aid to Scientific Work. (Booklet). Ilford Ltd., London.
Describes the characteristics of Ilford products recommended for use in different branches of science and technology.
- (11) Kodak Data Book of Applied Photography. Kodak Ltd., Harrow, Wealdstone.
A source book of examples and techniques with data on Kodak materials recommended for use in different branches of science and technology.
- (12) Photography Its Science and Practice. Roebuck and Stachle, Appleton Century Co., London, 1942.
Contains all that the potential user of photography as a tool needs to know about the science of the subject, with references to more comprehensive works.

phase of the Gothic revival is to be noted, the Early English, with consistently lighter work in all directions—lighter and more pointed arches—lancet windows in groups in the same framework.

The history of the period is chiefly written in the windows. The lancet became broader and the individuals of groups closer together. The solid masonry between windows was pierced with various shapes. At Kilworth there is a notable range of paired lancets with plate tracery at the heads and detached shaping in the jambs. Later, stone mullions took the place of the solid masonry heretofore found. It was a period of great activity throughout the country, from simple enlargements of windows to active enlargement and rebuilding.

The next period extended for only some fifty years—1300 to 1350—and was termed the "Decorated," and is characterised by a great exuberance of ornamented detail, at its best magnificent, at its worst just plain bad!

It was a period of great experiment in vaulting window tracery and construction generally. The whole church was showing a tendency towards becoming a stone framework for its windows and its carved features. The western end of Gaddesby is perhaps the best example in Leicestershire. Ball-flower ornaments, crocketed pinnacles and spires, arches and windows. Flamboyant tendencies, curvilinear forms and the rest, to be found everywhere. Piers and arches were nevertheless simpler and more graceful, but tombs, fonts, tabernacles, sedilia and Easter sepulchres made up in richness any lack in the archings. The west end of the south aisle at Gaddesby is the best example in Leicestershire of this type.

Windows in many churches show the same forms, probably due to the fact that centres were formed in certain places to work the stone which was brought to the site ready fabricated.

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sion; one did not look at a point when looking at a point. In a landscape the eye in some point in the middle foreground to a point on the right; the head could be held straight in front, could move; in either vision traversed the eye a selective recording in. When the camera lens at that landscape it did not see the whole field of the eye, everything that was seen in that direction. That was the reason why the photographer was disappointed with the subject as seen in the form of a photograph. It did not look as good as he

had in mind, all the talk and this new photographic method to be something quite different. It was something which was true. It might be a new vocabulary, and they were very careful in the Group to make themselves clear in this kind. The proceedings were widely read, and groups expressed at its core a certain amount of agreement. The Group could in some of the discussions express a few of these matters it was a great deal to help photography.

As heard about "new" and the "new" vision. "New" seemed to be applied to what photographers had rejected. In the old stand camera and the how difficult it was to get things right! And in the the hand camera one of its was considered to be he subjects vertically on; but nowadays some seem to go to work any round and to make something definitely really photographers. This fitted the description of her in itself is newness a vision.

In the book Mr. Cox had used any terms which of the time and had to explain that which of the illustrations was not easy to find to make the different as desirable, and which complicated by other things to composition. It owed most of their charm to the qualities of here were others, just as did not owe much to illustrations were chosen to demonstrating the

points raised in a simple and forcible manner.

Discussion

Mr. DUDLEY JOHNSTON said that he was in at the beginning of the book. He read the proofs, but he had recently read it again to find some points to raise in this discussion. He found himself, however, so thoroughly in agreement with all that Mr. Cox had said that he had very little to add. Everything had been expressed so clearly and admirably, and with such well-balanced judgment, that it was impossible to find anything to bring forward on the question of line. The illustrations were so well chosen in order to elucidate the points that his arguments were clinched throughout, and he had wondered what Mr. Cox would do when he came to expound the matter. It was interesting to hear what he had to say, although he had not dealt with the points raised specifically in his publication. The book was very valuable, and the Pictorial Group could regard its publication with great satisfaction. Whether it would bear fruit remained to be seen; he hoped it would bring about a better understanding of line. He quite agreed that pictorial photography could not be divorced from the principles of other graphic arts. They were representing something on a two-dimensional surface, and were bound to be governed by the restrictions, conditions and considerations which guided the graphic artists, and why these young revolutionaries wanted to be laws unto themselves and impose their curious vision upon others was more than he could understand.

Mr. GRATTAN, after glancing round the room, said that all present were somewhat elderly, and he thought it was the younger generation which was responsible for this different outlook of which Mr. Cox had spoken. He was very pleased to have the book because it had put him "on his feet" again. He had been very perturbed to see the increase of material on the walls of the exhibitions which he could not understand, although he would suggest that it must have some merit that enabled it to find its way to exhibition walls. If they all disapproved of it how did it become a reality?

Mr. WESTON thought perhaps the primary cause was the small camera, and Mr. Cox said that it had its own Press. If the Press thought anything was going to be popular it would make use of it.

Mr. GRATTAN said that the "new" work did not satisfy him in the way Mr. Cox's book did. The work got on to the exhibition walls; was there so

much submitted that if some was not accepted there would be no exhibition?

Mr. COX said that in most exhibition committees there were representatives of all points of view. On their own Selection Committee there were one or two members who had these so-called advanced views, and there had to be a certain amount of compromise. Although one might not be interested in it one might think there was a certain amount of merit in it.

He was not one of those who said that the miniature camera produced something different from other cameras, but some of the things done by the miniature camera could not be done by any other type of camera. Some of those things were good, and some of the things which they called new had a certain amount of merit. One tried to be as broadminded as possible for the sake of pictorial photography.

Mr. GRATTAN said his recollection went back quite a number of years. The Royal exhibitions used to be most diverse and thoroughly interesting, with a fine collection of different outlooks on pictorial photography. The exhibition had now become a collection of superlative photographic work with very little inspiration in it.

Mr. COX said that part of the "sameness" was due to the uniformity of processing in these days. Most of the prints seemed to be turned out mechanically. He thought it was due to the disappearance of the carbon print and various control processes, which, again, had been brought about by the great technical improvement in the chloride and bromide papers. In the days of which Mr. Grattan was speaking bromide papers as a general rule were very sad things indeed, and the other processes showed up very strongly by comparison. Now technique had arrived at a high degree of perfection which produced a more uniformly even result in an exhibition.

Mr. DUDLEY JOHNSTON said there was an economic aspect. Platinum paper was impossible to get; carbon and gum bichromate were ruled out because large glass plates were unobtainable.

Mr. GRATTAN said that it was not altogether a matter of processing. All would remember Dr. Julian Smith's one-man show, in which there was a large percentage of portraiture with every now and then a landscape. It was all of superlative quality and there was no monotony in it in spite of the large number of portraits. It was not a question of the processing, it was the vision of the artist who made the picture which mattered. They were seeing work

phase of the Gothic revival is to be noted, the Early English, with consistently lighter work in all directions—lighter and more pointed arches—lancet windows in groups in the same framework.

The history of the period is chiefly written in the windows. The lancet became broader and the individuals of groups closer together. The solid masonry between windows was pierced with various shapes. At Kilworth there is a notable range of paired lancets with plate tracery at the heads and detached shaping in the jambs. Later, stone mullions took the place of the solid masonry heretofore found. It was a period of great activity throughout the country, from simple enlargements of windows to active enlargement and rebuilding.

The next period extended for only some fifty years—1300 to 1350—and was termed the "Decorated," and is characterised by a great exuberance of ornamented detail, at its best magnificent, at its worst just plain bad!

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duced to keep safe the
r for those who desired to
r purposes of black magic
of the demoniacal arts.

f these are plain, others are
of the finest woodwork, and
rly to the roof, with their
pinnacles and arches.

also exhibit fine examples
rving of all ages. There are
ne pulpits in existence, and
are usually elaborately

south wall of the chancel in
the older churches are to be
ilia, usually triple, occasion-
e or single. They were made
for the priests, and orna-
many cases by the finest
and ornaments. Of the
l period there are many
of the most intricate work,
of the smaller and older
exhibit very plain niches
thickness of the wall.

east side of the sedilia,
ften in the south walls of
ad aisles—occasionally else-
to be found the piscina, a
h a drain, where the holy
re washed. Again they are of
and decorated.

chancel wall on the north
en to be found the Easter
or richly canopied recess—
fourteenth century or later,
altar Crucifix and the Host
t from Good Friday to
orning.

north chancel wall is often
aumbry or niche with doors
e holy vessels were kept.
doors are now few in number.
re few of the original stone
now—most were thrown
the Reformation, to be
at first by a wooden table,
the Jacobean type. That
y is a magnificent example.
edos also came in for dese-
t the Reformation—especi-
here the finest and most
rk was done—rows of saints
ed niches—the Last Supper
sacred subjects.

dwork much more should be
I can only call attention,
he pulpits and font covers
d, to the panelling of pews,
ls and so on. At Misterton
fine examples, and poupée
the shape of full-sized cocks
y. Subjects found vary in
olusion—fine plain relief
to representations of crafts
s.

pews are to be found—
n with a fireplace to keep
e warm.

all the woodwork none is to
red to the screen. Though
with rood loft were ordered

to be demolished at the Reformation,
and many were demolished, many
examples remain, though few with
the loft. The screen is again having
attention, and a fine example of work
happily and beautifully carried out
by the Birmingham Art Guild is to
be seen at Sibson, in the south-west
of the county.

Ironwork is chiefly to be noted in
hinges and an occasional bracket for
the hour-glass near the pulpit. Iron-
work gates, doors and screens are
chiefly found in the private chapels
dividing them from the main body of
the church.

Tombs and monuments form one
of the great attractions in our
churches; they make history real,

give life to our ideas of people, and
illustrate clothing and customs so
clearly.

The earlier are austere and plain,
the latter elaborate and often mag-
nificently coloured. The restoration
of the tomb of the Black Prince at
Canterbury must be seen to appreci-
ate its beauty and fascination. There
was a great centre at Nottingham
where alabaster workers perfected
their craftsmanship with marvellous
precision and probably with great
fidelity where a likeness was the
object.

The Reformation did not end this
craft, and there are several examples
of the later styles in Leicestershire,
notably the nearly life-sized figures



Noseley—the Hazlerigg tomb of Sir Thomas Hazlerigg,
16th January, 1629, and of Dame Francis Hazlerigg,
showing their eight sons and six daughters

photograph is a photograph which is similar to that central projection on the vertical plane (or to any other plane of reference which we have reason to select).

Let us now draw some conclusions from this property of central projection. The first is that a straight line on the object plane is again imaged as a straight line on the image plane. All the projecting rays from the object line to the nodal point of the lens lie in a plane, and it is the intersection of this plane with the image plane that determines the image line. Furthermore, two lines in the object plane which intersect in a point are imaged as two lines intersecting in the image of just this point.

The proposition that a straight line is again imaged as a straight line holds also in the process of enlarging, and thus we see that a straight line in the original object corresponds to a straight line in the final print; further, points located in the original object at the intersection of two lines are, of course, located in the final print at the intersection of the corresponding image lines.

Important practical conclusions drawn from this geometrical property

Let us assume that we know the position on the print of the images of four points A, B, C, D, which form a quadrilateral in the object plane. Then the position on the print of the image of every other object point is uniquely determined.

To see this we need only consider Figure 1a. This figure shows that with four such points as starting points we can draw a net of straight lines which in the end covers the whole plane quite closely,* and so innumerable points on this plane are located merely by the process of drawing straight lines through points which are either originally known or which are themselves found from such points by drawing such straight lines. Now, exactly the same process can be carried out in the plane of the print with straight lines that are the images of the lines on the object plane, and thus we are led to the location of the corresponding images. Figure 1b shows what such a Moebius

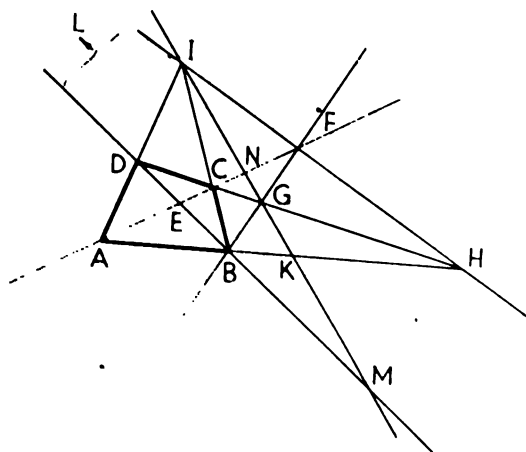


Fig. 1a

net would look like when the four original points A, B, C, D, form a rectangle, and where, therefore, the lines AB and DC (and many others as well) intersect at an infinite distance.

The result of the last paragraph is important, because it shows that once, for instance, we have adjusted our

* This net is called Moebius Net, after the astronomer Moebius (1790-1868).

enlarger so that a figure which was a square original object is again printed as a square on print, then we can be sure that all the other points on the print are correctly located. We need not worry that we have been tricked by just those four points, but that there are other points which are shifted by errors.*

How to get the four fundamental points in correct positions

The question with which we are left is, then, How do we get the images of four points which,

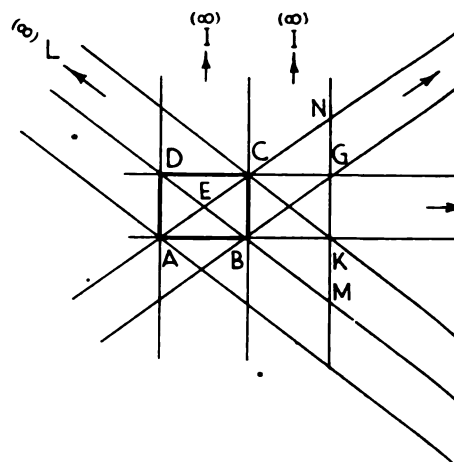


Fig. 1b

must not lie so that more than two fall on a straight line into their correct relative position? Are we thereby in certain directions, as, for instance, that we do so only when we produce a print which is smaller in size than the original negative? (This limitation is asserted by H. F. W. Lee in an article published in March, 1942, number of this *Journal*). Have we to choose a certain focal length in the enlarger, or are there no restrictions? The answer to these questions is:—

(a) We can produce a print to any scale we like.

(b) The focal length of the enlarging lens has to be within a certain range, of which the lower limit is practically zero, and of which the upper limit is in most cases usually so large that it will rarely forbid the use of a given lens.

(c) The relative position of the lens and the negative in the enlarger is not at our disposal. It has to be determined by judicious trial and error, i.e., by checking the positions of the four fundamental points on the print. If we have got this right, we need not worry any further. The simple geometrical reasoning given hereafter will get it right.

Proof of Point (a)

We will assume that we use as enlarger the same layout which was used for the production of the negative from the object.*

This means that we simply reverse the path of the rays and we get, therefore, a print which is not only similar to the original but actually identical in size. In most cases it will be considerably enlarged as compared to the negative.

* Attention is drawn again to the exclusions made in (*), page 85. We shall refer to this layout in future as the "original layout".

g out this reverse projection by means of the out, we may, most likely, be compelled to depth of focus" of the enlarging lens, for the son :—

ing the photograph the nodal plane of the ly parallel to the plane of the negative, so ct plane cannot be sharply imaged over the ve. To achieve this latter aim it would be e Appendix 1) that object plane, nodal plane id plane of the negative intersect in one line. on can obviously not be fulfilled when the is vertical and both the other planes are ch other and inclined. Therefore, every circle which was produced by a point of the object ve, when the photograph was taken, will pro- fusion of twice this diameter when we is reprojection with the original lens stop.* sing this lens stop (which may be quite hen we work at our leisure) we can reduce ation of the sharpness of the enlargement. is quite easy to avoid this deterioration r enlarger has an arrangement for swivelling nd its nodal point. We need only avail our- adjustment and make the nodal plane of the ough the line in which the plane of the print gative intersect.

ried out this swivelling operation we have djust the focal length of the enlarging lens oints where its axis meets the planes of print are again sharply focussed on to each other.† ept the projecting light by a screen which is e object plane but which is either nearer to lens or further away from it than the original a print is produced which is similar to the hich requires, of course, refocussing and ation of the swivelling arrangement. ing argument shows that it is possible, in btain prints to any scale we wish and with- n the depth of focus of the enlarging lens, have an enlarging lens of the proper focal le.

ellent illustration of the statement we made ing section, that the geometry of the pro- ed merely by the relative position of the tre and that the problem of getting a sharp settled entirely independent of this.

(b)

gement just considered the relative position oint of the lens and of the negative was the ie original layout. Every size of the final e selected was associated with a definite e printing screen (e.g., for a print in natural ting screen occupied the position of the t plane, for a print half this size the printing o be put, roughly, half-way between this : lens), and thus of the swivelling arrange- end, therefore, every size of the final print : a different focal length for the enlarging estion arises: Can we free ourselves from n?

m—of limited applicability—would be to g screen into the required position (leaving f the nodal point relative to the negative nd to operate the swivelling arrangement

f the circle is here thought to be measured in fractions nsions.

sume for a moment that the focussing of the enlarger ut by means of an adjustment of the focal length of at we need not unnecessarily break the continuity of

so as to give "in the mean" a sharp focus, i.e., to rely now on the "depth of focus" of the lens. This would, however, be a very clumsy way of handling the available facilities, as it means that we reduce the definition of the print needlessly.

The proper solution is, of course, to bring the centre of projection either closer to the plane of the negative or further away from it, and to operate the swivelling arrangement correctly so that the given enlarging lens will give again a sharp focus over the entire field. But now, having abandoned the original position of the projecting centre with respect to the negative, we are, so to speak, entirely at sea as regards the new position of this centre. In which direction are we allowed to shift it?

This question can be answered by the following considerations: Imagine that we are given the original optical layout, and imagine further that the whole space in which this layout is "immersed" is subject to a homogeneous deformation.*

In such a homogeneous deformation any plane transforms into another plane, and therefore any straight line—determined by the intersection of two such planes—will transform into another straight line. Two or more lines which intersect in one point transform into another set of lines, again intersecting in one point, this point being the "image"† of the first-mentioned point; of course, the position of this image can be determined by the intersection of the images of any two of these intersecting lines.

From these properties it follows that two figures which are central projections of each other transform into two other figures, which are again central projections of each other, for each of the projecting rays transforms into another projecting ray. The new centre of projection can be found by the intersection of two of the new projecting rays (or of the "image" of any other two lines which passed through the old centre of projection).

We are here interested in such homogeneous deformations which leave the figures in the plane of the negative and of the print unchanged in their dimensions but alter their relative positions.

Such deformations exist, and we can easily visualize them. In Figure 2 we have drawn a cross section through the plane of the (1:1 in size) print (p) and of the negative (n). Imagine the plane (p) hinged to the plane (n) along the line of intersection *s*; this line of intersection appears in the figure projected as point *S*; imagine further the whole space between these planes divided up by planes parallel to (p) and (n) as shown, these planes also being hinged to each other along their lines of intersection.

We can then rotate (p) around *s* and all the planes parallel to (p) will follow this rotation, while the planes parallel to (n) will carry out a shearing movement parallel to (n). The centre of projection which we marked by the letter *L* will thereby move on a circle round the

* A homogeneous deformation is one which can be obtained by evenly stretching (or compressing) the object first in one direction, then in another, and finally in a third direction. Actually, if we wish we may carry out these stretching operations in many more directions, but it can be shown that we do not get results which could not be obtained by stretchings in three properly selected directions.

An example for a homogeneous deformation which is equivalent to a stretching in one direction and an equal compression in the direction normal to this direction is a shearing deformation; it transforms a square with sides parallel to these two directions into a rectangle, and a square which is rotated by 45° with respect to the first square, into a rhombus.

† When we use here the expression "image" of a point, say *A*, produced by the homogeneous deformation, we merely mean the point *A*¹, to which *A* is shifted in the course of this deformation.

point T, as can be seen easily when we watch the movement of the two lines p^1 and n^1 intersecting in L.*

The movement just described produces a homogeneous deformation of the whole space, which of course leaves all the dimensions in the planes (m) and (p) unchanged, and where the centre of projection has carried out the desired movement towards or away from the plane of the negative.

By means of this deformation we have found a new optical layout which produces a print in natural size, but with a focal length different from the original one. Going further, by carrying out the operations discussed in the proof section (a), we obtain the whole range of prints by focal lengths which differ in due proportion from those used then. If we adjust the relative position of (p) and (n) and therefore the focal length for the 1:1 case properly, then we may make the focal length required for our actual print equal to the focal length of our given lens.

The reader need not follow these last considerations in detail. All that is required from the foregoing is that there exist permissible positions for the projecting centre which are closer to the negative (or further away) than the original one, and that all these positions lie on a circle through L with its centre at T. It is rather obvious that this gives us the possibility of adjustment which we need

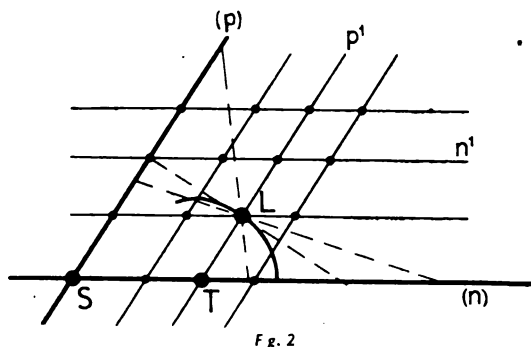


Fig. 2

in order to use the lens of given focal length. The fact that the radius of the fundamental circle is finite puts, of course, an upper limit to the largest distance lens-negative, and therefore to the largest focal length which we may employ. In practice this limit is rarely reached.

How to find the correct position of the lens with respect to the negative and the correct inclination of the printing screen

We have seen in the foregoing that points on the fundamental circle are permissible positions for the nodal point of the lens, and from what follows later in the present section it will be seen that positions not on this circle will lead to distorted prints. The question arises, therefore, how to find in a given practical case these correct positions. Also the question as to the correct inclination of the printing screen has to be answered. We will tackle these two problems in convenient steps. Let us assume that we had already found a position capable of giving a correct print, and let us assume that somebody has disturbed the adjustments of our enlarger.

(1) For the first case we will assume that the position of the lens with respect to the negative has been left untouched, but that the inclination of the printing plane

has been interfered with. We notice, of course, at once that such an interference has taken place, because the images of parallel lines will now no longer print as parallel lines. On that side of the printing screen which has been brought nearer to the lens the images will be closer together, and this gives us an easy way of returning to our correct adjustment.

(2) Let us now assume that the inclination of the printing screen has not been changed, but that the nodal point of the lens has been shifted with respect to the negative. The method of homogeneous deformation which we introduced in the preceding section allows us to find the consequences of such a change quite easily. So far we have considered only such homogeneous deformations which moved the centre of projection to different positions on the fundamental circle. Now we have to consider deformations which may move the centre of projection away from this circle but leave the plane of the negative still unchanged.

We can say at once what the consequences of such a deformation will be. The print, being subject to such a deformation will still show parallel lines as parallel lines, but the ratios of dimensions will no longer be correct neither will all the angles retain their correct values. Most people, when they make a print and wish to use this method of rectification, think only of the adjustment of the inclination of the printing screen. The effects of a maladjustment of the projection centre can be just as disastrous from the point of view of getting a correct print, and they are apt to baffle the uninitiated. Using, however, this method of homogeneous deformation, it is quite easy to follow up the consequences of such a maladjustment and to derive a simple rule for the necessary corrections.

Let us suppose that we have subjected the correct layout (as illustrated in Figure 2) to a homogeneous deformation, consisting of a stretching parallel to the plane of (p) and normal to the direction of s . We see then that due to this deformation the projecting centre has left the fundamental circle (it has moved away from T) but it is still in the plane of this circle. The consequences on the print of such a deformation are best seen on the image of a square which has its sides parallel and normal to s . It will now print as a rectangle, with the longer sides normal to s . The angle formed by the diagonals of the square will no longer be a right angle. The angle opposite s has become an acute angle. If we wish to bring back this rectangle to its correct form let us imagine that that side of it which is nearer to s as being fixed. We have then to push the "far- s " side of the rectangle towards s , and we see that this direction is also the direction in which we ought to shift the projecting centre in order to get back to the correct adjustment.

If, instead of stretching the correct layout, we subject it to some shear parallel to the direction of s , then we move the projecting centre out of the plane of the fundamental circle. The consequences of such a shear are, of course, that the print will also be sheared in a direction parallel to s , the image of the square just considered will become a rhombus. Again we find that the direction in which we have to push the "far- s " side of the rhombus, in order to bring it back to its correct shape, is the direction in which the projecting centre will have to be shifted.

The consideration of a case where we have, in addition to this shear parallel to s a shear normal to s , may be left to the reader; it will, of course, transform the rhombus into a parallelogram.

Summing up our position, we find that we can quite easily bring an incorrectly adjusted enlarger to its correct state (1):

(a) We look first for the images of parallel lines, and

* This circle shall be called in the following the "fundamental circle". In practical cases T falls usually outside the fundamental circle of the negative, and the path of L is then nearly normal to n .

these come out correctly as parallel lines by ang the inclination of the printing table ;

We then check either the dimensions of some ric figure, of which we know the correct ratios, or les formed by the lines of this figure.* If this check factory, then we have found one of the correct as of the projecting centre. If it is unsatisfactory, gine the test figure "glued down" on the "near- le, and consider in which direction we have to e "far-s" side in order to make it similar to the l. This direction gives us the direction in which e to shift the projecting centre in order to make come right. The inclination of the printing table affected by this second adjustment.

Also note that the use of a thick lens in place of our etical thin lens does not alter the two rules just

The nodal point, the position of which we have adjust, is, of course, the nodal point which receives ncipal rays coming from the negative. As all the nents are made by trial and error, we need actually mation as to the position of this nodal point as far adjustments (a) and (b) are concerned. Such dge is only desirable if we wish now to carry out t step, which is :—

The swivelling of the lens, so that its nodal plane through the line in which the plane of the negative the print intersect. This adjustment again can be out by trial and error ; the result aimed at is that ssing the print optimum sharpness is reached eously over the whole area of the print. Carry- this last adjustment, it is, of course, desirable that velling centre coincides with the nodal point, as se swivelling would interfere with adjustment owever, in practice, the natural thing to do is, se, to adjust the nodal plane of the lens while d and error process (b) is carried out. Therefore, primitive swivelling arrangement will be quite t.

at an idea of the magnitude of the error caused by r position of the nodal point, we will assume that een shifted by a distance δr from the fundamental i the plane of the circle. (A movement normal to e of this circle would produce pictures of buildings 'lean over' and is less likely to pass unnoticed).

a shift of the nodal point corresponds to a homo- deformation in which the print is stretched in a n normal to s. All dimensions measured in this n are multiplied by an error factor $1 \pm \frac{\delta r}{r}$ i.e., the subjected to a "strain" in this direction of amount here r is the radius of the fundamental circle. r is ned by the optical layout with which the photo- as taken, and (assuming the lens being focussed at) is approximately given by

$$r = \frac{f}{\sin \phi}$$

is the angle at which the plate was inclined. If a equal focal length is used for printing and, if we ay, $\delta r = \frac{1}{2}$ we arrive at the following table of ' for the various amounts of inclination :

ation of plate	5°	10°	15°	20°	30°	45°
in" × 100	2	3.5	5	7	10	14

ing in mind that a single right angle is not sufficient for this for example the transformation square → rectangle dis- the previous page).

This shows that for small inclinations even a gross mal- adjustment causes negligible error, a result which should be comforting to those who have used this method so far without being aware of its pitfalls.

APPENDIX I

The relation between the object plane, the image plane and the nodal plane of the lens

In this Appendix we shall prove that an object contained in one plane will have an image also contained in a plane, and that these two planes intersect each other in the nodal plane of the lens.

In Figure 3 we assume a co-ordinate system x, y, z , with the direction of z normal to the plane of the paper. The nodal point of the lens shall coincide with the co-ordinate origin, the nodal plane of the lens shall coincide with the plane $y-z$.

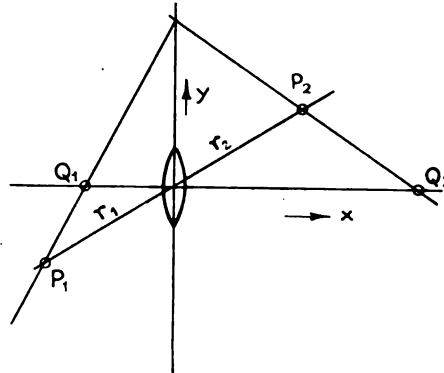


Fig. 3

A principal ray is shown from object point P_1 to image point P_2 . This ray is supposed to form the angles α, β, γ , with the positive co-ordinate axis, so that we have

$$\begin{aligned} x_1 &= r_1 \cos \alpha & x_2 &= r_2 \cos \alpha \\ (1) \quad y_1 &= r_1 \cos \beta & y_2 &= r_2 \cos \beta \\ z_1 &= r_1 \cos \gamma & z_2 &= r_2 \cos \gamma \end{aligned} \quad (2)$$

r_1 is in the case illustrated negative, r_2 positive.

If the lens has the focal length of f the relation between the x co-ordinate of P_1 and the x co-ordinate of P_2 is

$$\frac{1}{x_1} + \frac{1}{x_2} = \frac{1}{f} \quad (3)$$

If all our object points are contained in a plane E_1 of equation

$$Ax_1 + By_1 + Cz_1 + D = 0 \quad (4)$$

then we will show that all the image points are combined in a plane E_2 . To get the equation of E_2 , we rewrite (4) as follows :

$$A + B \frac{y_1}{x_1} + C \frac{z_1}{x_1} + \frac{D}{x_1} = 0 \quad (5)$$

Now, according to (1) and (2) we have

$$\frac{y_1}{x_1} = \frac{y_2}{x_2} \text{ and } \frac{z_1}{x_1} = \frac{z_2}{x_2} \quad (6)$$

and according to (3) we have

$$\frac{1}{x_1} + \frac{1}{x_2} = \frac{1}{f} \quad (7)$$

Therefore (4) becomes

$$A + B \frac{y_2}{x_2} + C \frac{z_2}{x_2} + D \left(\frac{1}{x_2} + \frac{1}{f} \right) = 0 \quad (8)$$



The Setting and the Baby

child of eighteen months and sat him at the piano, which he immediately began to play after his customary fashion, and this gave another first-rate picture. Among his recent sitters had been the grandson of the famous "Bubbles" (of Millais), and the two Princesses, whose little dog, in the corner of the picture, supplied an amusing footnote.

As a final point on the psychology of child portraiture, Mr. Adams said that he was "such an unconventional chap" himself that he could not work with anything stiff in form. It was always his purpose to get into the child's mind; until he had done so he could do nothing at all.

After his very informal talk he answered a number of questions. The total weight of his camera, he said, was about 36lb. No question about it had arisen on his various railway journeys except once on the Great Western, when an official demanded a surcharge. In vain did Mr. Adams explain that if it were not for the camera he himself would not be travelling at all. That point did not get home, and the official insisted on his pound of flesh. Then Mr. Adams asked him if he had received any new instructions about

such matters during the last nine or ten years, and on his saying that he had not, he told him that about that length of time ago his professional association (now the Institute of British Photographers) had successfully contested a similar demand. A photographer had been surcharged six shillings and eightpence, or some such amount, and it had been refunded with apologies. On getting the authentic documents from Mr. Bucknall, the secretary of the Institute, and showing them to the official, his face was "worth a photograph." "My word," he said, "to think of the number of people I have unjustly charged." And he hung the documents up in his office, to remind himself not to offend again.

In reply to questions about his methods, Mr. Adams said that he always took sharp and softened to his liking, or to the psychology of the child, on the print, having a fairly good memory and considering that 95 per cent of a child's portrait should be psychology. The psychology, too, should be wrapped up in everything—in the print itself, in the mount, even in the signature, which should be written harder in the case

of a "hard" child than in the case of a "gentle" one.

He did not like, personally, a print that was too warm in colour. His idea of a print in colour was that the colour should not be describable; it should be impossible to say that it was black, or saffron, or anything else. The colour of the print should be subordinate to the picture on it. He found that, for reasons not easily appreciable, some negatives yielded a far better colour print than others.

He could not use a photometer because he "had not the brains," and he could not use a miniature camera because he lacked the skill. He relied to a great extent on intuition. His friend, Mr. Bertram Park, who always uses a photometer, said to him once "You know, Adams, I should have given double that exposure for that," but when the negatives were seen, as Mr. Park agreed, they gave him all that he wanted in the print. He was guided a little by the aperture at which he was working, and he balanced up the whole thing. Sometimes, after he had got the subject in focus, the sun would come out, in which case he would simply put in a smaller stop, and if the sun went in again he would take the stop out. He

most of all a governable hat "shuts immediately you not one that dragged to open ged to shut. If he had to put dragging at all, he would shutter with a dragged opener than a dragged closing. se of children this quickness ially necessary, because of hood of movement of the the time. Indeed, he said e could not draw a child's would have to discard the rt of his work.

Thanks

Adams's brief talk was "by the handing round of a number of child portraits (country homes), which were admired, and on the proposition CHAIRMAN a hearty vote was conveyed to him for an ing and instructive evening. of these prints are here ed.



The Grandson



At the Piano



The Newcastle Portrait



Boy with Rabbit



Ready for Bath

SOME ENGLISH TREASURES

A Record of the Work of the National Buildings Record and the Central Council for the Care of Churches.

By Dr. K. K. Drury, A.R.P.S.

An interesting lecture on the work of the National Buildings Record and the Central Council for the Care of Churches was given by Dr. K. K. Drury, A.R.P.S., at the Joint Meeting of the Leicester and Leicestershire Photographic Society and The Royal Photographic Society at the Waterloo Hall, Waterloo Street, Leicester, on March 31st, 1942.

The Chair was occupied by the President of the Leicester and Leicestershire Photographic Society, Mr. E. Tyler.

Dr. Drury, who is the Honorary Secretary of the Leicestershire Committee of the National Buildings Record, said :—

I WISH first to speak briefly of the work of the National Buildings Record and the Central Committee for the Care of Churches. The C.C.C.C. has been in existence for some time. It is part of the organisation of the Church of England, and exists to collect records of our churches so as to advise in restoration enlargements, etc. Naturally, since war started and wanton destruction faces our historic buildings this work has been of added importance. Many appeals have been made for assistance in collecting records, photographs, drawings, etc., of the churches, great and small, throughout the land.

A little after the war started the Government felt the need for a central body to collect records of all historic and noteworthy buildings, domestic and secular as well as ecclesiastical. They therefore got the Master of the Rolls, as titular head of the Records, to call a meeting of those interested, the outcome of which was the National Buildings Record. This consists of representatives of the Archaeological, Architectural, Photographic and other learned societies, bodies and interested individuals. The N.B.R. works in close collaboration with the C.C.C.C., and their object is to see what buildings are worthy of record, what records exist, and to provide new records where necessary. As there was a deal of overlapping of effort, these bodies have endeavoured to get County Committees formed to ensure that all areas are adequately covered and to enlist local talent, uncover old records and ensure economy of working. Such a Committee has been formed in Leicestershire under the Presidency of the Lord Lieutenant, Sir Arthur Hazlerigg, the Vice-Presidents being the Lord Mayor of the City, the Chairman of the County Council (Sir

Robert Martin), the Lord Bishop of the Diocese, and Mr. William Keay representing the Architects. The working committee includes two representatives from this Society, three architects, two archaeologists, with myself as Honorary Secretary.

So far a great deal has been done. Mr. Keay, at the request of the Ministry of Works and Buildings, got together a panel of architects to cover the county and list the buildings therein that were considered worthy of record. This list has been our foundation stone. We have unearthed a great mass of records from various places, and these are being sorted, collated and placed under the appropriate headings.

The George Henton collection of photographs, now the property of the Leicestershire Archaeological Society, has formed a great fund of knowledge. Mr. Newton's vast collection of photographs has also ably increased our assets, together with the collections of Dr. Rothesay Stewart, Mr. Attenborough and the Museum. A good many measured drawings and plans have been noted by the architects and others, and there are various drawings and sketches available. The photographers of the county have also come to our aid, though not as freely as we would have liked, but nobly in some cases.

Mr. Bedingfield has been indefatigable, and has made records of some fifty-three churches. Mr. Fathers has done some wonderful work in the city churches, whilst others have assisted in excellent surveys of individual churches and buildings.

My committee are making a preliminary printed record of the work so far done, but much more is needed, and it is in this direction that I seek your aid. One item alone illustrates my point. Very few photographs

exist of the north side windows and walls of the churches. The reason is easy to see. The south side is so easy with the sun on it, the north side is so much the reverse with the light against one. Much is also missed because in many cases the photographer has little knowledge of the detail he sees. May I quote myself as an example? Though I have long had a liking for architectural detail, and had, in fact, between 1907 and 1912, made quite a collection of slides of church towers and steeples—alas! a great war casualty—I did not have any real knowledge of even the outlines of architectural and archaeological knowledge. It was only when I became Secretary to this Record Committee I thought I had better know something of the terms at least used by my learned Chairman, Mr. Lovell, F.S.A., and his equally learned confrères. There are masses of literature on all aspects of the work and most of the authors appear often to give a slightly different name and description for the same object. That probably is only to confuse the learner and make the mystery the more profound!

I have therefore got together some slides to show you, and ask you to come with me for a short tour of some of the parish churches to see what may be seen. If one has some slight knowledge of what there is to be looked for, the photography of the subject becomes so much more fascinating, and since I started I have found much of great interest, giving great mental satisfaction. The subject is so vast that I have confined myself to parish churches, leaving out the cathedrals, priories, and secular and domestic buildings.

The slides I hope to show you have been very kindly lent me by the C.C.C.C., the Leicester museum authorities and Mr. Fathers.

Leicestershire is unfortunately not so richly endowed with churches of merit as other counties, our close neighbours, for instance, Northamptonshire and Rutland, both full of interest, but nevertheless there is much of merit and beauty.

Most of our parish churches were built before the Reformation, few since. What few there are are mostly in the cities and other centres of population, built to make provision for the increasing density of the urban districts.

First let us examine the plan of the church and see how it has evolved.

The early Saxon church was usually wood and wattle, and consequently has ceased to exist from the ravages of time. Only one early wooden church remains, that at Greenstead, in Essex, and it has been

s, F.R.P.S., Mr. B. Hutch-R.P.S.; Chairman, Mr. Lambeth, A.R.P.S.; Honorary Secretary and Curator, Mr. Cutts; Honorary Exhibition and Treasurer, Mr. W. R. R.P.S.; Honorary Lantern-T. L. Williams, A.R.P.S.; Reporter, Mr. H. C. F.R.P.S.; Honorary Mr. T. L. Williams and Mr. Committee, Mrs. Dorothy s. W. R. Kay, Messrs. A. C. D. Burr, L. A. Leith and ner.

h Standards Institution

Annual General Meeting of Standards Institution, Sir hley, K.B.E., C.B., accepted tion to remain as Chairman neral Council.

F. Armstrong, F.R.S., for- airman of the Clerical Divi- uncil, was co-opted as a it member of the General

airman reported the recog- H.M. Government of the n as the body for the issue al standards with the excep- hose issued by the Medical, Council in the British Phar- and Codex.

he last meeting the Institu- published 160 new and re- ndards, bringing the total 1,300. These include war y specifications prepared at st of the Ministry of Aircraft n, Board of Trade, Ministry Security and Ministry of

Standard Specifications are : of the voluntary work of 0 representatives of most of rial and trade organisations ntry.

Laptain J. A. Cash

ze recently heard from Mr. ash, A.R.P.S., the popular urer. Mr. Cash secured an ent with the War Office as a her, and has been in Egypt a. He writes enthusias- out the latter country : was absolutely grand, and ry I am just longing to get with my own camera, some is full of good material for as a very welcome change desert, for which I have l to say!"

Cash covered most of last ampaign. He went beyond and returned to cover id Helfaye, which, he says, od from the photographic He was in a hot spot in

Sollum, but came out unscathed, "largely because Italian snipers are rotten shots, I think!"

In his spare time, Captain Cash is taking pictures illustrating life in Egypt, and has many opportunities of getting out to the countryside, and finds it full of pictures. He adds that he is doing "quite a bit of lecturing on various subjects, but not, of course, with slides."

We shall look forward with very much pleasure and interest to the time when Captain Cash is able to resume his lecture career, when he will be able to tell us of his experiences, and show us some of the pictures which he has made during his war-time travels.

The Photographic Convention

A meeting of the members of the Photographic Convention will be held at 16, Prince's Gate, S.W.7, on Wednesday, May 5th, 1943, at 3 p.m., by invitation of The Royal Photographic Society.

The President, Mr. W. P. Trebilco, A.R.P.S., and Mr. G. C. Weston, F.R.P.S., have arranged a cine display of Convention films taken at Exeter in 1939. The Central Association of Photographic Societies Annual Exhibition will be on view. It is hoped that afternoon tea can be provided for Members, if war-time conditions allow.

Will members desiring to be present kindly inform the Assistant Secretary, Miss E. E. A. Beattie, A.R.P.S., 67, Kings Road, Bournemouth, of their intention to attend, before April 30th, 1943?

Snow Movies

In "Motion Picture Facts," in *American Photography*, March, 1942, by A. J. Lockrey, we are told that the secret of successful snow-movies is exposure, and, no less important, camera angle. The latter must almost invariably be such that you are looking toward the light either directly or at any angle—in other words, on the shadow side, working against the light, because otherwise, you would have no shadows to photograph. Optimum conditions should be found on a clear and sunshiny day a couple of hours or more before or after noon, working anywhere from 90° either way to directly towards the sun. "On clear days you will be working in a flood of invisible ultra-violet light (not the visible haze) which will deceive both your eye and the meter. There is no way of measuring it conveniently, but it is safe to allow an extra 25 per cent for it." . . . an additional 25 per cent under-exposure should be allowed by reason of the fact that your subject matter is white and highly reflective and to ensure full shadow pattern. "This means a full half-stop smaller opening than your meter calls for."

Madras Amateur Photographic Society

We hear from the Hon. Secretary of the Madras Amateur Photographic Society, Mr. C. G. Jagannathadas, B.A., B.L., A.R.P.S., that as part of its 10th Anniversary celebration it organised the 5th Madras (All India) Salon of Photography, with sections for cine films and transparencies, last December.

OBITUARY

William H. Zerbe, F.R.P.S.

It is with much regret that we have to record the death of Mr. William H. Zerbe, which took place at his home in New York, on January 5th.

Mr. Zerbe was seventy-eight years of age at the time of his death, sixty of which his whole working life were passed in the exercise of his profession as a Press photographer. He was the *dean* of American Press photographers, and was on the staff of the *New York Herald* from about 1913 to 1920 and again from 1922 to 1924, the *Daily News* from 1920 to 1922, and the *New York Herald Tribune* from March 19th, 1924, when the *Herald* was absorbed by the *New York Tribune*.

Mr. Zerbe was interested in photography as a hobby as well as a profession, and exhibited very fine pictures at the leading Salons in the course of his career.

He was a member of the Oval Table Society, the New York Camera Club, and joined The Royal Photographic Society in 1932. In 1933 he was admitted to the Associateship, and in 1938 the Fellowship of the Society was conferred upon him in recognition and appreciation of his services to Photography.

He was a man of many friends, and will be greatly missed. In referring to his death, Mr. Joseph M. Bing, our Honorary Foreign Corresponding Member in New York, writes of him: "He was very, very fine, much beloved, highly respected. He was the dean of Press photographers, a great teacher, a man who made others happy."

These few words convey a perfect picture of his essential character and personality, and as a tribute could not be improved upon.

R.P.S. PROCEEDINGS COUNCIL MEETING

A MEETING of the Council of The Royal Photographic Society was held at 16, Prince's Gate, S.W.7, on 8th February, when the following were present: The President, Mr. D. McMaster, in the chair; Messrs. H. Baines, A. J. Bull, A. J. Catford, L. V. Chilton, J. H. Coote, W. J. Foster, Percy W. Harris, G. E. W. Herbert, T. Midgley Illingworth, J. D. Johnston, R. H. Lawton, F. J. Mortimer, J. H. Pledge, S. Schofield, Thomas H. B. Scott, F. J. Tritton, C. Waller, and G. C. Weston.

New Members

The following Candidates were nominated for Membership:—

- Joseph Francis Bennett, 74, Bower Road, Sheffield. (Member, Sheffield Photographic Society).
Reginald W. Board, 7, Foss Bank, Lincoln. (Member, Lincoln Camera Club).
Edith I. Bjorkman (Miss), 34, Monroe Place, Brooklyn, New York. (Member, Miniature Camera Club of New York).
Walter R. Cocks, 111, Parker Road, Hastings.
Charles Colin Dunham, 20, Hawkeshead Road, Sheffield 9, Yorks. (Member, Sheffield Photographic Society).
Douglas Ernest Mannering Douglas-Morris (Dr.), Plas Amherst, Harlech, N. Wales.
Geoffrey Currie Eltringham, 44, Leaside Crescent, Golders Green, N.W.11.
Sidney Briton John Ellis, 16, Lester Road, Chatham.
John Greenwell Frizell, M.P.S., 10, Skinnergate, Darlington. (Member, Darlington Camera Club).
Reginald Frank Fletcher, 414, Church Street, Bush Hill Park, N.9. (Member, Southgate Photographic Society).
Wm. Leslie Gardner, Elm House, Askwood, nr. Pontefract. (Member, The Gloucester Postal Photographic Society, Birmingham).
Archibald Moffatt Hardy, Vankleek Hill, Ontario.
Norman Kingsley Harrison, 39, Fordhook Avenue, Ealing, W.5.
W. M. Hill, 68, Coldharbour Lane, Bushey, Herts. (Member, Kodak Works Photographic Society).
Douglas Haydon Hooper, Burney Cottage, West Humble, Dorking.
Frank Cornwall Hunot (Surgeon Captain, R.N.), Royal Naval Hospital, Haslar, Gosport, Hants. (Member, Plymouth Institute P.S.).
Charles Edward St. John d'El Quixano Iffla (Major), c/o The Ambassador, Ankara, c/o The F.O., London.
Aubrey Kemp, 24, Clifford Avenue, East Sheen, S.W.14.

- Alfred Kessler, 106, Wychall Road, Northfield, Birmingham 31. (Member, Handsworth Photographic Society).
Lawrence Teviot Kletz, 427, Bury New Road, Salford 7, Lancs. (Member, Salford Cine Society).
George Lawrence, 24, Dover Road, Sheffield 11. (Member, Sheffield Photographic Society).
Frank Melville Lambert, Tree Tops, Totteridge, N.2.
Sandy Lewis, Wakington, Beverley, Yorks.
Arthur Lewis, Officers' Mess, R.A.F., Chipping Warden, nr. Banbury.
Carlos Saavedra Mendez, Paraguay 1327, 6M., Buenos Aires, Argentine.
Clifford Milborrow, 9, Limsfield Avenue, Thornton Heath, Surrey.
Richard Parkin, 7, Sneyd Street, Cathedral Road, Cardiff. (Member, Cardiff Camera Club).
Margaret Johnstone Parsons, Windlehurst, Hemycok, Devon.
Robert Peel, Fronsedale, Blakewell Mead, Painswick, Stroud, Glos. (Member, Stroud C.C.).
William Arthur Peacock, Flat 59, Appleby Lodge, Manchester 14. (Member, Manchester Amateur Photographic Society).
John Wallace Picken, 2, Waverley Avenue, Kilmarnock, Ayrshire.
James Samuel Plant, The Hollies, Hillcrest Avenue, Kingsley-Holt, Staffs.
John Renwick, Lamony Dyke, Weston Lane, Otley, Yorks.
Henry Riding, 2, Wilworth Crescent, Blackburn.
V. J. Rogers, 10, Connell Street, Toowoomba, Queensland, Australia.
Leonard Russell, *Sunday Times*, 200, Grays Inn Road, W.C.1.
Edmund Thomas Scott (C.P.L.), Huntley Burn, Mt. Macedon, Victoria, Australia.
Constance Edna Shield, c/o Yvonne's Studio, 98, Charing Cross Road, W.C.2.
Frank Chester Sharp, 71, Wadhurst Road, Edgbaston, Birmingham 17. (Member, Birmingham Photographic Society).

Frederick Shaw, Willow Garth, Park Avenue, Chapeltown, N. Sheffield. (Member, The Chapeltown Film Club).

Robert Charles Morris Smith, A.I.C., 40, Herent Drive, Ilford.

William Ferguson Sommerville, 353, Main Street, Rutherglen, Glasgow.

John A. Stewart, F.S.A. (Scott), Bonaly, Clynder, by Helensburgh Dumbartonshire.

Walter Thomas Stowe, 21, Harborough Road, Streatham, S.W.16. (Member, John Ruskin Camera Club).

Harold G. Suggate, 2, Broadway House, W.8.

H. M. Tyas, B.Sc., Merlewood, 14, Cemetery Road, Mexborough, Yorks.

Gordon M. Tranter, 3048, 1st Street, West, Roxboro Place, Calgary, Alta.

Edward Thornton, 47, Morrison Street, London, S.W.11. (Member, Battersea Men's Institute Camera Club).

Frank Fenner Thorpe, 79, Seagrave Crescent, Gleadless, Sheffield 2. (Member, Sheffield Photographic Society).

Lawrence Farbon Wass (Captain), 1, Canadian Field Survey Coy., R.C.E., 1, Canadian Army, England.

Alfred William Watkins, Olde Tyles, Camp Road, Gerrards Cross, Bucks.

Norman Stuart Wheelwright, C.A., 146, Devonshire Way, Shirley, Croydon.

Margaret Weekes (Mrs.), Leebank, 3, Rotherfield Road, Boscombe. (Member, Bournemouth Camera Club).

Robert Ian Wolfenden, 61, Gainsborough Road, Blackpool.

George Ronald Walker, 74, Fixby Road, Fixby, Huddersfield.

Herbert Cecil Watts, 43, Maudsley Road, Coventry.

Alice W. D. Wood (Mrs.), 2, Primley Park Avenue, Alwoodley, Leeds. (Member, Leeds Camera Club).

William Whitaker, Two Trees, Marina Drive, Rosehill, Marple, Cheshire. (Member, Manchester Amateur Photographic Society; Stockport Photographic Society).

Sydney Herbert Wilkes, 6, The Grangeway, Grange Park, N.21.

Oliver William Wilmot, Holly Cottage, Windsor Road, Petersfield, Hants. (Member, Petersfield Camera Club).

The Candidates who were nominated at the meeting of the Council held on 11th January (see p. 30, February issue, this *Journal*), were elected to Membership.

Obituary

The Council regretted to learn of the loss by death of the following Members:—

Albert Ogden, Oldham.

Alfred T. Mole, London (formerly an Associate).

Herbert Pickwell, London (Associate).

H. Vandyk, Cape Town.

JUNIOR MEMBERSHIP

1155302 L.A.C. George Douglas Alford, c/o 103, Conway Street, Long Eaton, nr. Nottingham.

Ludwicka Krakowska (Miss), Thorene, Southfield Road, Leesons, Chislehurst, Kent.

Stuart Arthur Stephen Shrimpton, Combermere, 30, Deganwy Avenue, Llandudno, N. Wales.

Thomas Patrick Smyth, 22, Kings Road, Wimbledon, S.W.19.

Bernard Alistair Storey, The Studio, Dale Road, Matlock.

Stanley George Walters, 14, Churchfield Road, Welling, Kent.

Barry Martin Taylor, 44, Links Avenue, Gidea Park, Essex.

Admission to Affiliation

The following Society was admitted to affiliation (subject to the recommendation of The Central Association of Photographic Societies):—
Tottenham Photographic Society (Secretary, Mr. L. C. Kingston, 42, Halstead Gardens, Winchmore Hill, N.21).

R.P.S. Membership Competition

In 1942 Mr. J. B. Stansfield, B.Sc. (Associate), in appreciation of the advantages of Membership of The R.P.S., offered, with the approval of the Council, to defray the first year's subscription to the Society of the successful winner of a Competition, to be open to the Members of the Leicester and Leicestershire Photographic Society.

It was now reported that the successful winner of the Competition was Mr. A. E. Harvey, of 508, Welford Road, Leicester.

Re-Instatement in the Associateship

It was unanimously resolved that Dr. Wm. H. Woglom, of New York, be re-instated in the Associateship upon re-joining the Society.

Conferment of Fellowship

It was unanimously resolved that the Fellowship be conferred upon Mr. U. V. Bogaerde (Member) and Mr. G. E. W. Herbert (Member) in recognition and appreciation of their services to photography.

[Mr. U. V. Bogaerde has been for many years Art Editor of *The Times*,

and has carried out much experimental work with the object of advancing the possibilities of Press Photography.

Mr. Herbert is well known as an amateur photographer, specialising in Stereoscopic Photography, as a judge and exhibitor in this branch of Photography at the Annual Exhibition of the R.P.S., as a popular lecturer, and as a member of the Executive Committee of the Central Association of Photographic Societies. He is also the Editor of *The C.A. Bulletin*, and is a representative of The Photographic Alliance upon the Council of the R.P.S.]

Annual Report and Accounts, 1942

The Council adopted the Annual Report and Accounts and authorised the President to sign the Report and Balance Sheet and the Hon. Treasurer to sign the Balance Sheet.

Gift

The Council accepted, with much appreciation, the gift of three books: "Bichromate Process," by Cruwys Richards, "Art and the Photograph," by Anthony Guest, and "Figure Painting," Studio Special Number, for inclusion in the Library, from Mr. R. H. Lawton (Hon. Fellow).

NEW PREMISES' SPECIAL FUND

The following donations are gratefully acknowledged:—

	£	s.	d.
Amount previously acknowledged	11235	5	9
Anonymous (2nd donation)	1	1	0
Thomas Bell, Esq. (5th donation)	1	1	0
M. Bentley, Esq. (6th donation)	10	6	
J. D. Bettencourt, Esq. (8th donation)	1	1	0
P. Broome, Esq.	3	0	
R. G. Cann, Esq. (2nd donation)	16	0	
James Charles, Esq. (4th donation)	5	6	
F. S. Eden, Esq. (7th donation)	8	0	
R. G. Fennah, Esq. (2nd donation)	1	1	0
G. Gullick, Esq. (3rd donation)	1	1	0
Shirley M. Hall, Esq. (3rd donation)	2	2	0
W. Harvey, Esq.	1	1	0
G. E. W. Herbert, Esq. (6th donation)	10	6	
Harold Holmes, Esq. (2nd donation)	3	0	
Thomas W. Howard, Esq.	5	0	
R. E. C. Hudson, Esq. (7th donation)	10	6	
Mrs. B. Humphrey (8th donation)	13	0	
A. H. Lucas, Esq.	5	0	0
Henry C. Mills, Esq. (8th donation)	1	1	0
Dana Mitchell, Esq.	1	0	0
Miss M. K. Myers	10	0	
L. W. Offord, Esq. (2nd donation)	13	6	
Charles G. Pearson, Esq. (2nd donation)	13	0	
J. M. Poots, Esq.	1	1	0
Baroness Popper-Kohlenegg	18	0	

Carried forward ... 11250 15 3

	£	s.	d.
Brought forward ...	11250	15	3
Ray Podmore, Esq. (7th donation)		3	0
W. J. Rankin, Esq.	1	1	0
Bertram Sinkinson, Esq. (3rd donation)	1	1	0
A. L. Spence, Esq. (2nd donation)		10	6
H. Threlfall, Esq.		3	0
Cecil Thomas, Esq. (2nd donation)		8	0
Oscar Way, Esq. (4th donation)	1	1	0
O. Wild, Esq. (3rd donation)		8	0
H. J. van Winsim, Esq.		1	1
Alfred G. Wood, Esq.		1	1
Harold Wood, Esq. (6th donation)		10	6
D. P. Woosley, Esq. (7th donation)	1	1	0
Miss D. Wright (3rd donation)		6	0
Hay Wrightson, Esq. (2nd donation)	3	3	0
F. G. Wrigley, Esq.	1	1	0
	11271	14	3

Chesterfield Photographic Society

Chesterfield Photographic Society is organising its first open Exhibition.

It will be held from July 12th to 31st, and Mr. F. J. Mortimer, C.B.E., Hon. F.R.P.S., will judge the entries.

The Exhibition will include classes for pictorial work and portraiture, natural history and scientific photography, architecture and record work. The latest date for receiving entries will be Saturday, July 3rd.

Entry forms and all further information may be obtained from the Hon. Exhibition Secretary, Mr. R. Wilsher, c/o Hamblin, 2, Corporation Street, Chesterfield.

ANNOUNCEMENTS

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2.2s.6d. Group subscriptions, which became due for renewal on the same day, are as follows: Scientific and Technical Group, 7s. 6d.; Pictorial Group, 5s.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s.; Kinematograph Section, 5s.

Group subscriptions may be included with the Annual Subscriptions and should be forwarded to the Secretary, The Royal Photographic Society, 16 Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscriptions to the Society through their own Bank to The National City Bank of New York in New York, or direct to The National City Bank of New York. Such subscriptions should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square Branch, London, account Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to ask them to mention their names, addresses and status (Fellow, Associate, Member); and Members making the remittance direct to The National City Bank of New York are requested to give this information.

It is important to note that payment should be made

"For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the same time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

LECTURE SESSION

The following meetings will be held at 16, Prince's Gate, S.W.7 (unless otherwise stated):

Friday, March 5th, 6 p.m. Annual General Meeting of the Pictorial Group, to be followed by "My Hundred Best Lantern Slides," by J. Dudley Johnston, Hon. F.R.P.S.

Saturday, March 6th, 3 p.m. Meeting arranged by the Pictorial Group. A Talk by Lancelot Vining, F.R.P.S.

Tuesday, March 9th, 3 p.m. Annual General Meeting, Members, Associates, Fellows, only.

Saturday, March 13th, 2.30 p.m. Annual General Meeting of the Colour Group. 3 p.m. "Making Colour Prints," By Jack H. Coote, F.R.P.S.

Saturday, March 20th, 2.30 p.m. Annual General Meeting of the Kinematograph Section. 3 p.m. Meeting arranged by the Kinematograph Section. "Sight and Sound in Sub-Standards and Colour Film and Slow Speed Recording," By Rex Calvert and Alex. Waters. (British Corporation).

Saturday, March 27th, 2.30 p.m. Annual General Meeting of the Miniature Camera Group. 3 p.m. Technical and Pictorial Criticisms, by D. McMaster, F.R.P.S., and Richard N. Haile, F.R.P.S.

Tuesday, March 30th, 5 p.m. Annual General Meeting of the Scientific and Technical Group.

Saturday, April 3rd. Meeting arranged by the Colour Group. "Some Difficulties of Reproduction," By H. V. Walters, B.Sc.

Saturday, April 10th. Annual General Meeting of The Photographic Alliance, followed by Executive Committee Meeting.

Saturday, April 17th, 3 p.m. Meeting arranged by the Kinematograph Section. "Cinematography in War Time, No. 5—The Development of Kinematography in the Army," By Capt. F. Stuart, R.A.O.C.

Saturday, April 24th, Easter. No Meeting.

Saturday, May 1st, 3 p.m. Meeting arranged by the Colour Group. "Forty Years of Colour Exhibition," By F. H. Jones, B.Sc., F.I.C.P., F.R.P.S.

Saturday, May 15th, 3 p.m. Projection of Slides accepted for the Central Association Exhibition.

JOINT MEETINGS

We have pleasure in announcing the following joint meetings for Joint Meetings:

Bath Photographic Society, 18, Queen's Square, Bath.

Thursday, April 1st. A Lecture by Mr. G. H. R. Allen, F.R.P.S.

Birmingham Photographic Society, York House, Great Church Street, Birmingham.

Tuesday, March 9th, 6.30 p.m. Cine Films, "Everybody's Free," etc. By John Chear, F.R.P.S.

Bradford Photographic Society, Mechanics' Institute, Bradford.

Manchester Amateur Photographic Society, 49, Lower Victoria Street, Manchester.

Saturday, May 22nd, 3 p.m. "Photography's Part in the War," by F. J. Mortimer, C.B.E., F.R.S.A., Hon. F.R.P.S.

Leicester and Leicestershire Photographic Society, at the Waterloo Hall, Waterloo Street, Leicester.

Rotherham Photographic Society, The Crofts, Moorgate, Rotherham.

Sunday, March 14th, 3 p.m. "Old Rotherham," By Miss D. Green and E. Selvin.

EXHIBITIONS AT 16, PRINCE'S GATE

March 4th to 31st. (1) Miniature Camera Group Members' Exhibition. (2) Prints from the Permanent Collection.

April. (1) Prints by Overseas Readers of *The Amateur Photographer*. (2) Natural History Prints by Captain G. K. Yeates, F.R.P.S.

May. Central Association Exhibition.

June. (1) Pictorial Group Annual Exhibition. (2) Spanish Cathedrals and Churches. By J. R. H. Weaver, M.A., Principal, Trinity College, Oxford.

July. (1) *The Amateur Photographer* Prize Competition Prints. (2) Colour Photography.

September-October. R.P.S. Annual Exhibition.

Fellowship and Associateship

Notice is hereby given that applications for the Fellowship and Associateship in all Sections will be considered by the Advisory Committee appointed by the Council. Associateship desiring to take up the Fellowship and Members desiring to take up the Associateship in any Section, should address their applications to the Secretary not later than April 1st, or forms to be obtained from him at 16 Prince's Gate, S.W.7.

The Advisory Committees in all Sections will meet half-yearly in future, in April and October.

Miniature Camera Group Postal Portfolios

We regret that in our last issue (page 63) the address of Mr. T. R. Knight, the Honorary Secretary of "Circle 4," was incorrectly given as 71 Shirley Road, Hall Green, Birmingham.

All interested please note that Mr. Knight's address is 741, Shirley Road, Hall Green, Birmingham 28.

PHOTOGRAPHY IN SCIENCE, ART AND INDUSTRY

SPECIAL NUMBER

THE PHOTOGRAPHIC JOURNAL

THE OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND THE
PHOTOGRAPHIC ALLIANCE

VOLUME
XXXIII

APRIL, 1943

TWO SHILLINGS
AND SIXPENCE



WAR

A striking photograph of modern warfare taken on the spot during the advance of the 8th Army to Tripoli. The film, with others, was sent back to Cairo by dispatch rider, processed there and transmitted by radio to London and New York. It was released to the Press in London within forty-eight hours of the occurrence of the incident on the battlefield in North Africa.

Photography's Part in the War : Third Year

SOME ENGLISH TREASURES

A Record of the Work of the National Buildings Record and the Central Council for the Care of Churches.

By Dr. K. K. Drury, A.R.P.S.

An interesting lecture on the work of the National Buildings Record and the Central Council for the Care of Churches was given by Dr. K. K. Drury, A.R.P.S., at the Joint Meeting of the Leicester and Leicestershire Photographic Society and The Royal Photographic Society at the Waterloo Hall, Waterloo Street, Leicester, on March 31st, 1942.

The Chair was occupied by the President of the Leicester and Leicestershire Photographic Society, Mr. E. Tyler.

Dr. Drury, who is the Honorary Secretary of the Leicestershire Committee of the National Buildings Record, said :—

I WISH first to speak briefly of the work of the National Buildings Record and the Central Committee for the Care of Churches. The C.C.C.C. has been in existence for some time. It is part of the organisation of the Church of England, and exists to collect records of our churches so as to advise in restoration enlargements, etc. Naturally, since war started and wanton destruction faces our historic buildings this work has been of added importance. Many appeals have been made for assistance in collecting records, photographs, drawings, etc., of the churches, great and small, throughout the land.

A little after the war started the Government felt the need for a central body to collect records of all historic and noteworthy buildings, domestic and secular as well as ecclesiastical. They therefore got the Master of the Rolls, as titular head of the Records, to call a meeting of those interested, the outcome of which was the National Buildings Record. This consists of representatives of the Archaeological, Architectural, Photographic and other learned societies, bodies and interested individuals. The N.B.R. works in close collaboration with the C.C.C.C., and their object is to see what buildings are worthy of record, what records exist, and to provide new records where necessary. As there was a deal of overlapping of effort, these bodies have endeavoured to get County Committees formed to ensure that all areas are adequately covered and to enlist local talent, uncover old records and ensure economy of working. Such a Committee has been formed in Leicestershire under the Presidency of the Lord Lieutenant, Sir Arthur Hazlerigg, the Vice-Presidents being the Lord Mayor of the City, the Chairman of the County Council (Sir

Robert Martin), the Lord Bishop of the Diocese, and Mr. William Keay representing the Architects. The working committee includes two representatives from this Society, three architects, two archaeologists, with myself as Honorary Secretary.

So far a great deal has been done. Mr. Keay, at the request of the Ministry of Works and Buildings, got together a panel of architects to cover the county and list the buildings therein that were considered worthy of record. This list has been our foundation stone. We have unearthed a great mass of records from various places, and these are being sorted, collated and placed under the appropriate headings.

The George Henton collection of photographs, now the property of the Leicestershire Archaeological Society, has formed a great fund of knowledge. Mr. Newton's vast collection of photographs has also ably increased our assets, together with the collections of Dr. Rothesay Stewart, Mr. Attenborough and the Museum. A good many measured drawings and plans have been noted by the architects and others, and there are various drawings and sketches available. The photographers of the county have also come to our aid, though not as freely as we would have liked, but nobly in some cases.

Mr. Bedingfield has been indefatigable, and has made records of some fifty-three churches. Mr. Fathers has done some wonderful work in the city churches, whilst others have assisted in excellent surveys of individual churches and buildings.

My committee are making a preliminary printed record of the work so far done, but much more is needed, and it is in this direction that I seek your aid. One item alone illustrates my point. Very few photographs

exist of the north side windows and walls of the churches. The reason is easy to see. The south side is so easy with the sun on it, the north side is so much the reverse with the light against one. Much is also missed because in many cases the photographer has little knowledge of the detail he sees. May I quote myself as an example? Though I have long had a liking for architectural detail, and had, in fact, between 1907 and 1912, made quite a collection of slides of church towers and steeples—alas! a great war casualty—I did not have any real knowledge of even the outlines of architectural and archaeological knowledge. It was only when I became Secretary to this Record Committee I thought I had better know something of the terms at least used by my learned Chairman, Mr. Lovell, F.S.A., and his equally learned confrères. There are masses of literature on all aspects of the work and most of the authors appear often to give a slightly different name and description for the same object. That probably is only to confuse the learner and make the mystery the more profound!

I have therefore got together some slides to show you, and ask you to come with me for a short tour of some of the parish churches to see what may be seen. If one has some slight knowledge of what there is to be looked for, the photography of the subject becomes so much more fascinating, and since I started I have found much of great interest, giving great mental satisfaction. The subject is so vast that I have confined myself to parish churches, leaving out the cathedrals, priories, and secular and domestic buildings.

The slides I hope to show you have been very kindly lent me by the C.C.C.C., the Leicester museum authorities and Mr. Fathers.

Leicestershire is unfortunately not so richly endowed with churches of merit as other counties, our close neighbours, for instance, Northamptonshire and Rutland, both full of interest, but nevertheless there is much of merit and beauty.

Most of our parish churches were built before the Reformation, few since. What few there are are mostly in the cities and other centres of population, built to make provision for the increasing density of the urban districts.

First let us examine the plan of the church and see how it has evolved.

The early Saxon church was usually wood and wattle, and consequently has ceased to exist from the ravages of time. Only one early wooden church remains, that at Greenstead, in Essex, and it has been

much restored as well as enlarged.

The later Saxon church was usually stone built, and consisted of a small rectangular building with a narrow opening in the east wall leading to a small semi-circular or rectangular chancel or sanctuary. These churches were mostly on the north side of the hamlet or village, often near the manor house, and usually on the north side of the burial ground, as it was considered unlucky to be buried in the shade of the church.

The next step in evolution consisted in enlarging the chancel and usually the archway thereto. Then the nave became too small, so side lean-tos were made, piercing the walls with arches and making thereby the aisles; or else transepts were formed to the north and south. Later, often the aisles and transepts were enlarged to the east, making the church again a large rectangle with a row of piers and arches down both north and south sides. To provide more light, the nave, and at times the chancel walls, were raised and a series of windows provided above the level of the aisle roofs—the clerestory. Side chapels, porches and vestries were added as required.

This then is the principle on which the parish church is founded, and it can be seen that we will find churches in all stages of this evolution and containing, therefore, fragments of all ages from the date of the original foundation. Some churches, it will be observed, were built *de novo* on the plan and have remained much the same, as at Kegworth. Often they have been enlarged piecemeal, whilst others have been pulled down and rebuilt.

This evolution of the church was brought about in two ways—firstly, the increase in the numbers of converts and in the population, made larger churches necessary; secondly, the advance in engineering and architectural knowledge made it possible.

The straight stone lintel supported on piers made windows and arches small and the walls disproportionately thick. The Romans evolved the rounded arch with keystones, giving greater strength but needing massive centerings when building large openings. Gradually the art of making large arches and windows with lightweight walls became established, and from what must have been dark gloomy caverns, lit only by slits in the massive walls, emerged the pre-Reformation church of large windows, delicately glazed in glowing-coloured glass, supported by a minimum of stonework, itself a masterpiece of the stonemason's art. Stratford-on-Avon is a magnificent example.

Our Victorian archaeological ex-

perts had great delight in tracing this evolution and labelled each successive phase to their own satisfaction, but the experts of to-day apparently recognise that definite date labels are impossible when the difficulties in travel, the distances and the dearth of desirable materials in certain districts are recognised.

All things considered, it is a wonder that the evolutionary plans were so widespread, and so similar in far-flung areas.

The windows and arches apparently give the clue to most of these changes.

The Saxon types were short, narrow and round-headed. Windows had a narrow splay outside and a wide one inside. The opening was small, glass being non-existent.

The Norman types were, though small, larger, still round-headed, and arches being supported on massive pillars, doors showing many recessive "orders." There was much more ornamentation and light. Glass was coming into use, and in consequence the conditions inside must have been more pleasant. This Norman phase appears to have lasted till about 1140. From that date till about 1170 changes to the Gothic style from the Romanesque were being made. This stage is commonly termed the "Transitional." There is confusion of styles to be seen, but chiefly the emphasis appears to have been on less ornamentation and greater use of mouldings with arches and lancet windows in groups of two or three.

From about 1170 to 1260 the first



Kirby Bellars Broach Spire ;
one of the finest in the country

K. K. Drury,
M.D., R.R.P.S.

phase of the Gothic revival is to be noted, the Early English, with consistently lighter work in all directions—lighter and more pointed arches—lancet windows in groups in the same framework.

The history of the period is chiefly written in the windows. The lancet became broader and the individuals of groups closer together. The solid masonry between windows was pierced with various shapes. At Kilworth there is a notable range of paired lancets with plate tracery at the heads and detached shaping in the jambs. Later, stone mullions took the place of the solid masonry heretofore found. It was a period of great activity throughout the country, from simple enlargements of windows to active enlargement and rebuilding.

The next period extended for only some fifty years—1300 to 1350—and was termed the "Decorated," and is characterised by a great exuberance of ornamented detail, at its best magnificent, at its worst just plain bad!

It was a period of great experiment in vaulting window tracery and construction generally. The whole church was showing a tendency towards becoming a stone framework for its windows and its carved features. The western end of Gaddesby is perhaps the best example in Leicestershire. Ball-flower ornaments, crocketed pinnacles and spires, arches and windows. Flamboyant tendencies, curvilinear forms and the rest, to be found everywhere. Piers and arches were nevertheless simpler and more graceful, but tombs, fonts, tabernacles, sedilia and Easter sepulchres made up in richness any lack in the archings. The west end of the south aisle at Gaddesby is the best example in Leicestershire of this type.

Windows in many churches show the same forms, probably due to the fact that centres were formed in certain places to work the stone which was brought to the site ready fabricated.

But in the height of its development this phase was cut short by the Black Death of 1348-9, which in two years carried off a third of the population of the country. In every direction work had to cease on account of the shortage of labour. But we must always be thankful that this stringency did not warp or spoil development. Far from it, for the "Perpendicular" period that followed—nearly two hundred years to 1535—gave us the culmination of the true English development of the Gothic.

Shortage of labour made stone scarce; hence lighter and larger windows. Difficulties in glazing the flamboyant and decorated styles of window gave the simpler and more

graceful forms of the period. Then the artist in glass came into his own, and churches were large and airy buildings of glass, supported by light stonework, blazing with the most subtle and brilliant colours—an art that appears to have been lost.

The shortage of skilled stone-masons gave also the woodworker his chance. The magnificent examples of screens, benches and roofs that still happily remain give us proof of the good taste and manipulative facility of the woodcraftsman.

The Reformation ended this period abruptly, and during the next 130 years, though there was some building and rebuilding, there was more desecration and destruction.

The next period is that of the English Renaissance, and to the Great Fire and Sir Christopher Wren we owe the masterly development of the style. But outside the cities there was little done, and I do not think Leicestershire owns any examples.

A few words about the fittings and accessories may be of interest, and tower, spire and steeple are naturally the first to be examined.

Some eighty examples of Saxon towers remain. They were relatively high—70 feet or more—rough-hewn and often with light pilaster strip. They were probably more of use as watch-towers than for bell-hanging, and were situated at the western extremity of the church.

The Anglo-Norman tower, on the other hand, was shorter, much more massive, with occasional tiers of arcading. There were no spires, but an occasional stumpy short tile-covered central spirelet—to throw off the rain from the upper roof. They were central in position or at the west end of the church. In the 13th century the spire and tower became part and parcel of the same construction and design. The broad spire was perhaps the supreme achievement of the age.

Of all the building designs, those of the spire and tower appear to be the most localised, large areas tending to one type, others to another, and so on.

The subject is one of never-ending delight, be it the stumpy fifty-footer of Sall, in Norfolk, the panelled richness of the Somerset fraternity, or the soaring delight of the Boston Stump.

Leicestershire can boast some of the best examples of the broach—St. Martin's; Kirby Bellars.

The Renaissance style pleases some—not so others; but its airy lightness must for ever impress, especially when seen amongst the heaviness of the commercial buildings in London—even the ruins!

The porch has always been of special significance in church history.

It was one of the chief glories of King Solomon's temple. It played an important part in many of the church ceremonies in England. Parts of the rites of baptism, marriage and burial started in the porch—usually to be found on the south side of the nave. With the porch, the doorway, door and its ironwork are all of interest. Norman doorways are still numerous, and many have been moved from site to site with the successive widening of the body of the church, though every rebuilding means more and more restoration work.

Porches were often two-storied, and occasionally three-storied; giving living space for the priest, or watchman, storage of arms, records, or place for the church school.

Gargoyles and grotesque carvings appear to me to be difficult to reconcile with church atmosphere, but in few other buildings do we meet with such a collection of curious beasts, demoniac faces and other contorted figures. The medieval love of the grotesque had full play here, and the individual craftsman had full play for his fancy and powers.

Gargoyles are spout heads—the original roofs shed their rain direct. Later the parapet appeared, which made it both safer to get to the roof and easier to collect the rainfall into safe channels that did not threaten the foundations. The spouts from these gutters gave an excuse for the grotesque that is to be seen in all districts; there is a remarkable array of this in the Mendips and in Lincolnshire. There are some fine examples at Gaddesby and Melton.

Though stone vaulting occurs in parish churches, it is comparatively rare except in the porches and towers. Fine examples of lierne work occur in Bristol and Nantwich. There is at least one example of a north aisle with stone vault in Leicestershire. The wooden roof in all its forms is, however, the usual parish church roof. There are numerous types, from the plain beam, the coupled beam, to the single and double hammer beams.

The Leicestershire roofs are not noteworthy, being usually of the plain type with an occasional barrel roof.

So far I have mentioned chiefly—briefly and inadequately—the structural features, but there are other features—the fittings—that are of equal interest.

Fonts there are of every type and shape, on every kind of support. Sometimes ancient bowls on later period stands; carved and plain bowls; cylindrical; cupped; rectangular and many-sided. There are still five of the noted black Turnai marble fonts—these in Hampshire.

Font covers are of interest. They



termine the most efficient operative ds, the motions made by the war worker's are recorded by light streaks obtained by ing a torch bulb to the wrist of the operative at work

free of reduction that the graphic images occupy only 1/250th of the area required by originals, and weigh only 1/100th of the weight of the originals. An aeroplane can carry approximately one hundred times as many in this film form as in their original form. After transportation to the country of destination, they are enlarged on photographic paper to 5 inches by 4 inches, and the enlargement so made is dispatched by post to the addressee.

When the system was started in 1941, the growth of the Airgraph network has been rapid. For the Army and R.A.F., there are Airgraph services to almost every theatre where British troops are engaged. A service to Madagascar was actually started during an early stage of the hostilities.

These facilities are no longer confined to the members of H.M.

The civilian Airgraph service has already been extended to twelve countries and territories, and further extensions are anticipated.

In the year 1942 approximately 7 million Airgraph letters were safely transmitted, and at the same time the number of Airgraph letters dispatched from this country exceeds one million per week; a large number are arriving each day at the British Isles from overseas. One plane sometimes carries film representing a total of one and a half million letters.

Each Airgraph form is serially numbered so that every letter can be traced individually. When the flying boat "Clare" was lost on a homeward flight from

West Africa, a number of Airgraph films were lost with her, but because their serial numbers were known, they could be repeated, and many thousands of people in this country heard from sons, husbands or fathers just as though no accident had occurred. Without photography this would not have been possible.

The technique of the Airgraph is being applied to more than correspondence between people at home and the men overseas. One use is for pay sheets of units in the Middle East; these are photographed on to the same sort of film as is used in Airgraphs and sent by air mail to this country. In that way a photographic print of every pay sheet can be available in London three weeks after the soldiers sign at a pay table in the desert.

Another use of the Airgraph and the microfilm has been started by the



Servicing cameras and photographic equipment is one of the many duties of the W.A.A.F.s

Association of Special Libraries and Information Bureau. It is very necessary to see the technical journals of enemy and enemy-occupied countries (although they are as carefully censored as our own technical journals), and, of course, they are not available for ordinary distribution. Reprints are now prepared by the use of the Airgraph technique, and can be viewed and read in the Recordak viewing machine.

There is no need for me to stress again the extent to which the miniature film photography, generally known as microfilm work, is finding its innumerable applications at the present time, in recording valuable documents in the custody of banks, solicitors' record offices, churches and museums, and in Government offices, producing thereby permanent records in miniature that can be easily stored in safety, and reproduced to the size of the original at short notice, either in the form of prints or on the Recordak viewing machine, for easy reference should the originals suffer damage from enemy action or other form of destruction.

Miniature camera technique is also proving its extreme value in miniature radiography in X-ray examination. This work has grown enormously since my reference to it last year, and is now one of the most valuable tools in the fight against tuberculosis.

It has been used primarily in the Navy, sailors being specially subject to tuberculosis, but it is extended to other services and, in some cases, to factory employees. A use of full-sized film for every member of a ship's crew would be too expensive in view of the large number of



Women and War Work. The above are part of a series of photographic records made to illustrate the variety of work undertaken by women in the war



The f/24 aerial camera, complete with magazine and remote controls for fitting into aircraft

pictures which have to be taken, though the use of larger film is resorted to if any signs of tuberculosis have been detected by means of the small film. The small film records, in order to be examined, are projected back to 10 by 8 inches.



The camera in position, fixed in the floor of the aircraft, and operated by remote control

The camera unit consists of a funnel-shaped tunnel with the camera fixed at the smaller end, and the fluorescent screen and grid at the larger end. The tunnel is light-tight, and provides a fixed distance between the film plane and the fluorescent screen—a distance which is determined by experiment when the image is in focus.

For the current work, a Contax camera, which takes thirty-six exposures, is in use, the lens having an aperture of $f/1.5$ and having a focal length of two inches. But a specially made camera with simple operation and taking a larger roll of film is being made for this work, in one instance to take 100 feet of film, with a cutting device provided to enable any length of exposed film to be divided from the main roll.

The British Red Cross has now a special van for miniature radio-

graphy, designed by Mr. H. T. Ferrier, to accommodate generator and complete X-ray equipment, with the interior fitted as a darkroom.

A special camera for miniature radiography has also been designed by Mr. W. Watson, of Ilford Limited (made by A. E. Schall & Son, Ltd.). This camera is completely automatic and is fitted with a Taylor, Taylor & Hobson fluoride-coated $f/1$ lens. This lens enables the exposure to be reduced by sixty per cent, as compared with that required by the $f/1.5$ lens.

The growing interest in every quarter regarding the value of photography in present-day activities connected with the war was evidenced in the autumn at the House of The Royal Photographic Society, when an Exhibition of Photography in Science and Industry, organised by the Association of Scientific Workers, was opened by Sir Robert Watson Watt, of the Ministry of Aircraft Production and Scientific Adviser of the Air Ministry.

This Exhibition was primarily to demonstrate to scientists the very wide field over which photography could help them in their problems, and, also, to remind photographers that the science of applied photography has a vital part to play in the war effort.

In modern engineering practice, for instance, both general, mechanical and electrical, photography occupies a position that becomes a vital one in these days, in the preparation of war-like material on which the lives of our fighting forces depend.

Photography, in one form or another, is alone capable of ascertaining exactly how metals, used in the production of weapons, aeroplanes, and tools and machinery for making them, react under stresses and strains, and is used extensively in detecting cracks, flaws and other faults entirely hidden from the eye,



The camera projecting from the floor of the aircraft, showing the reflecting mirror in position for oblique records of low-level raids



The latest cine gun camera for recording actual aerial combat and for training fighter pilots

but which might develop and cause disaster if not seen in time.

High-speed photography is now widely employed in the analysis of fast machine motions. The Kodak Type II high-speed cine camera is capable of taking pictures at rates up



The camera fitted with reflecting mirror for oblique pictures during low-level bombing raids

to nearly 3,000 per second, thus effectively slowing down motion on the screen 180 times, and, in the same connection, the Kodatron speed-lamp which gives an intense flash of very short duration (down to $1/30,000$ th second). This is used for taking still photographs of moving machinery with a normal camera.

Reference must be made to Kodak Transfer Sensitising Paper for the sensitisation of metal for printing templates in engineering work, either by contact or enlarging.

[This process was described and illustrated by Mr. Mortimer in his lecture, and is the subject of a separate article by Dr. Batley, elsewhere in this issue.—Ed.]

An alternative process for the same purpose has been instituted at General Aircraft, Limited.

This process has been made possible by a new type of sensitive emulsion,

ed by Dr. C. I. Jacobson, S., of Messrs. Photographic Industries and Chemicals, Ltd. Using this process, the drawing technique is followed in the way in the production of a drawing from the assembly. drawn in indian ink on a sheet of fluorescent material.

The next stage is purely photographic. The light sensitive material Dr. Jacobson has prepared is to be something new in the photographic emulsions. It is an acquer base, and is, I believe, the first cellulose emulsion to be on the market. It can be brushed or sprayed on to the fluorescent material, where it dries rapidly to a thin hard surface in five minutes. The emulsion is optically insensitive to light when dry and can still be handled safely under half-watt light when dry. As soon as the coating is dry, the piece of metal can be placed into contact with the ink drawing in a holder and exposed to the light of an arc lamp for about three seconds. The plate is then removed and the surface lightly rubbed over with a piece of cotton wool soaked in solution of a special developer, immediately causes a firm, brown, positive image to appear as though by magic. This development of the image takes about ten seconds only, and no other chemical treatment is required. The plate is given a short rinse in water, dried on one side to dry, before going down to the shops for cutting. X-ray crystallography is used in this technique to discover flaws in the structure of war materials such as aluminium alloy. By using rays of higher penetrating power, even seven inches of steel can be penetrated.

is an X-ray photograph of blow-holes in stellite welding on the head, and here, blow-holes in aluminium casting. The defect is shown, and, having been detected, time is not wasted building a plane with the possibilities of structural failure in the air, a disaster. In one aircraft alone, hundreds of sheets of film are used to examine them, and this safeguard makes it possible to use twenty-five per cent of the material with safety, as it is not necessary to compensate for possible defects by adding weight. Here, then, is an application of photography that saves materials, saves work, and saves lives.

The use of photographic means of detecting workers, already referred to, in instances of ingenious detection in the case of certain



The bombs away, the observer then presses the button which operates the camera taking the photographs as the aircraft leaves the target and the bombs are exploding

firms under the aegis of the Ministry of Supply.



On their way at Lorient. Photograph taken as an attack began of a heavy pair of bombs taken immediately after their release. The U-boat shelters are partly visible through the fins of one of the bombs

Motion analysis by photography finds a technical application in



A Night Attack. Showing bombs hurtling towards the target and lit up by flames and incendiaries

increasing the efficiency of factory work depending on manual labour. An example of this application of photography is illustrated. The motions made by the operative's hand are recorded by the pattern of light streaks, which depict three repetitions of an operation involving two distinct extension movements of the arm. The record, which shows how closely the movement is repeated, was obtained by fastening a torch bulb to the wrist of the operative and photographing its movement during a time exposure, at a very small aperture. This exposure was supplemented by a flash exposure to record the position of the girl and the work bench.

Such records are of value for determining the easiest and most efficient operative methods, either with a view to the improvement of routine operations, or to the training of new recruits in factory practice. Here is another field in which photography serves the industrialist in war work.

It will have been observed in some of the photographs that I have already shown that the work in the factories is being undertaken by women and girls. This, of course, is no news to you, but it seems an opportunity that I should not miss of specially referring to this phase of activity brought about by war conditions. There is no doubt that women are playing a very great part in the war and, in many cases, in a way that is not fully appreciated. Photography may bring this home.

[Mr. Mortimer, at this point, showed a series of pictures of women engaged in various phases of war work, in addition to those in the regular uniformed organisations.—Ed.]

For vital importance in the war, the photographic work of the Royal Air Force continues to take a very high place. Successful and accurate reconnaissance from the air by photography has become the life-blood of all the fighting forces, and the development of this phase of work by the R.A.F. would make a very big lecture in itself, and I can only touch very briefly on the outstanding features, which, coupled with what I have said on previous occasions, will give some idea of the work as it is being done to-day.

The average photographer would be staggered if he knew the enormous quantities of aircraft cameras and photographic equipment generally which is required by the R.A.F. The tremendous production illustrates what great importance is placed on air photography by the War Cabinet and the Royal Air Force.



The Bomber's welcome. The appearance of a barrage of ack-ack and tracer bullet fire as bombers approach their objective

One development during the year 1942 has been the increasing size of the original negative for certain purposes. The Eagle—R.A.F. Type 49 camera, for instance, manufac-

training the R.A.F. photographers. Fortunately, the R.A.F. found a ready response to the call for recruits. Amongst those who joined were many skilled amateurs, and not a few professionals of life-long experience. Aided by the specialised training of the R.A.F. Schools of Photography, their knowledge has proved invaluable, for it is only by the skill and experience of trained men that the new equipment can be maintained and used to the best advantage. Members of the W.A.A.F. are also proving very successful in photographic work.

The uses of air photography in war are legion: I can describe only a few of the more important.

Bomber Command is concerned with locating the target and recording the actual attack, so that success may



In the thick of it. The effect of dodging and swerving on the part of the plane from which this photograph was taken is indicated in the lines of the "flak" recorded

be established beyond doubt. Since vast areas are covered, the checking of targets is a colossal task, but it must be carried out so that the crews may be shown, before they leave the ground, exactly what the target looks like, even when highly camouflaged.

I am indebted to Group-Captain Laws, Chief of the Photographic Division of the Air Ministry, who has placed a considerable amount of information and data at my disposal for the purpose of this lecture. He has particularly emphasised the fact that the tendency to-day, as experience has been gained with this photographic work, is standardisation of apparatus.

The development of special air cameras was slow at first, but once the possibilities were recognised the effort was intensified, until, at length, the camera known as the F.24, taking negatives five inches by five inches, was evolved by the R.A.F.

This, as I described on a previous occasion, was an efficient and reliable instrument at the outbreak of the present war. In the development of this camera attention has been paid



A direct hit photographed by low-level oblique camera, showing the immediate effect of the bombing

tured by the Williamson Manufacturing Co., has a picture size of nine inches by nine inches, and perforated film is employed. This camera is a high precision survey instrument, fitted with louvre shutter and full instruments recording altitude, time, data levels and special numbering on the edge of the film. Messrs. Ross, Ltd., have produced a six-inch $f/5.5$ lens which gives remarkable results on the nine-inch by nine-inch film, constituting an extraordinary wide-angle coverage.

Lenses of very much longer focal lengths can also be satisfactorily fitted. The F.24 aircraft camera, made both by Messrs. Kodak and by Williamsons, is, however, the camera that is most in use for general reconnaissance work, and I will refer to this later.

Apart from the production of equipment, there has been the equally important problem of recruiting and



A daylight reconnaissance photograph after the raid on the Renault works, clearly showing the damage done



Interior of mobile darkroom attached to R.A.F., complete for processing negatives and prints

speed sprocket system, which takes it through the processing tanks, through a squeegee and out through the case of the magazine, which is fitted with a guillotine cutter. A developed and stabilised negative is fed out of the camera in approximately two minutes from the time of exposure.

Perhaps one of the most interesting applications of photography in the R.A.F. is the use of the cine-camera gun, also made by the Williamson Manufacturing Co., for recording actual aerial combat and for training fighter pilots. When used in actual combat, these cameras provide incontestable proof of enemy aircraft being shot to pieces, and many extracts have been included as "high-lights" in films for release to the public.

The cine-camera gun uses 16 mm. film, and is mounted in the aircraft as a "fixed" or "free" gun, to be used in addition to other guns when in action, or in place of an actual gun during practice. It is automatically started with the depression of the gun-firing switch and "shoots" a series of pictures to the attacker.

Processing in the R.A.F. has now been highly standardised, and is entirely carried out by the time-temperature method. By this means it is possible to produce uniformly high quality, even in processing individual spools of film from day to day. This is conducted in either specially equipped buildings or in mobile vans fitted as darkrooms.

A small army of photo finishers, airmen and W.A.A.F's are kept busy day and night turning out the prints for the various intelligence branches. Here, again, it is vital that quality shall be maintained. The intelligence officers are mainly concerned with microscopic details in

shadows and high lights, and if photography is to play its part, none of this must be lost. On small sections this work is done by expert photographers, but on larger sections machinery has again been brought into play, and automatic printing machines, capable of handling up to 600 prints an hour, keep pace with the ever-growing demand for more and more pictures.

The Army, also, has co-operation reconnaissance personnel, who are the



The Focke-Wulf Kurier. A typical model photograph for identification purposes, by table-top methods, by Ilford Ltd.

eyes of the Army in warfare, and are always on the watch for enemy movements. Speed is of vital



Periscope photograph of the sinking of an enemy ship

importance if the best use is to be made of this information, and special processing sections are pushed up as



A camouflaged battleship at sea. The camouflage design is worked out on models and photographed, the photographs being subsequently used as guides for the ship itself



Interpretation officers studying aerial photographs of enemy positions, taken in series by reconnaissance aircraft

closely as possible to the actual front line. Magazines are dropped by parachute to avoid landing delay, and a special rapid processing equipment is installed so that the Interpretation Officer may get prints within ten minutes of the magazine arriving in the processing section. This special processing is done in a spiral type processing tank, and the technique involves the use of highly concentrated solutions, which give adequate development in one and a quarter minutes. The negatives are printed wet on specially prepared paper.

The development of interpretation of reconnaissance photographs has steadily grown, and an important side of the work is stereoscopic interpretation. When photographs are taken in series by automatic exposures by a plane flying over a certain district, the sequence of the exposures can be so adjusted in relation to the speed and height of the plane that the resulting pictures overlap to the extent of fifty per cent. or more. When a continuous film, therefore, is developed, each adjacent pair of pictures shows an overlap of subject of a considerable amount, but with a view separation that may vary from a hundred yards to a mile. These pictures, examined stereoscopically, place a new power in the hands of the interpreter, and what was originally a plain map-like view of a town or district springs into stereoscopic relief when treated in this manner, and much more useful detail becomes available.

Related to aerial work is another application of photography that is becoming an essential war necessity. This is aircraft recognition.

This has become a very important part of the training, both of airmen and members of the R.A.F. ground staff, and in the Army also, particularly those connected with "ack-ack" batteries,

this, special training graphs are presented in a variety of ways until the observer is able to recognize both British and enemy aircraft, when they are in formation, in flight.

Positions of the air are studied first, and photographs of individual planes of different types which have been prepared from photographs and form the basis of the study, and, although the use of silhouette views of particular type are very limited, the need for photographs is unlimited.

No two are alike, and each photograph may reveal a fresh characteristic of that particular aircraft.

Recognition photographs that are just shown are made from very large scale models, and are photographed with a miniature camera. The Ilford Company have perfected this technique, and it has been widely adopted as a method of producing recognition material in the Army services.

When leaving air photography, another application of photography in relation to the war, which is of slight, is of value in its own right, and, as with many phases of photography to which we referred, is being further developed.

As far as what is known as the Air Rescue Service. This, as you are probably aware, has been brought into existence by the war, and is being very vital and important. The name indicates, it deals with the relief and rescue of flying men. In their own words, have been "killed in the drink"—in other words, they have been shot down, or crashed, when flying over the sea, and it is here that photography has been able to help, notably in



A cameraman of the Army Photographic Unit filming a bombardment in the Libyan battle zone, protected against surprise attack by a Bren gunner.



At Tobruk. An army cameraman climbs an observation post and hoists his equipment up after him.

regard to the sea itself, which, to many of the airmen, is nothing more than to be covered as quickly as possible, and to which no other consideration is given. Endeavours were made early on to provide, by photography, some form of instruction that would enable flying men, whose, on certain occasions, took them over the waters, to recognise and appreciate ocean conditions, and the matter of wave formation, direction, and effect of currents, wind, and all the other natural actions and reactions that can modify wave formation and create a variation of water surfaces.

As you know, there is an admirable little booklet published by the Ministry of Information, in connection with the Air Ministry and the Admiralty, and entitled "At-Sea Rescue," in which the incidents and tragedies of this work are fully

detailed and illustrated by photographs.

In the Navy photography also plays a part, but not to the extent that it does in the Air Force. The Admiralty has made a definite concession, however, by employing about two dozen official naval photographers. These men, before joining the service, were all Press photographers, and they have been allocated to ships in the various theatres of war, primarily for obtaining photographs depicting the activities of the Navy for Press purposes. In this case the normal Press camera, mostly of 9 by 12 cm., is being used with Ross "Xpres" lens and Ross telephoto lens.

A photographic rating is also borne with all big ships, and in some of the smaller ships, for technical purposes. They use one or two special cameras, notably the dial camera for recording a gunner's accuracy by photographing his position, and it records also the readings and settings of fire-controlled instruments, taking forty pictures at one second's interval. There is also the Gunnery Recording camera which is mounted for recording errors of the salvos for deflection.

The Newman Smith cine camera is also used, and the L.24 reconnaissance camera, already referred to, in use by the Royal Air Force is used by the Fleet Air Arm.

It is interesting to note that the camera is also used in conjunction with the periscope sight of the submarine. Here, for instance, is a photograph taken in this way of a sinking Italian ship that had just been torpedoed by a British submarine.

Another point, to which photography helps, is the other side of the coin, that of the "rescue." Much of



A photographic record of Rommel's retreat, showing a German Mark III tank left on the battlefield by the retreating Germans.



A member of the Army Photographic Unit developing film in a darkroom in the Middle East.



Transmitting photograph by radio. The print is fastened round the cylinder shown above. This is covered in and rotates by means of a motor synchronised with a similar motor at the receiving end. The transmission depends on the reflection of a pencil of light, projected on to the surface of the revolving photograph, which actuates a photo-electric cell and converts the light into sound.

the camouflage is tried out in the first instance on models, which are then photographed in conjunction with stretches representing the sea under various conditions and lightings. In this way the efficiency of the camouflage is tested before it is applied eventually to the ships for which it is intended.

During the recent months, the activities of the Army have been in

the public eye almost as much as the R.A.F. and the Navy, due largely to the movements connected with the Egyptian and Libyan campaigns, and in other fields.

The War Office has now established photographic units to accompany the troops at the front, and has further supplemented them by the enlistment of a number of Press photographers, who, in many cases, were Fleet Street cameramen, with a flair for news pictures and "scoops."

Further than this, the leading film companies and film units are also now fully represented with the British Army in the field, in addition to the Army's own film unit, which accompanies the troops into action. This is quite separate from, and independent of, the accredited Press photographers and newsreel cameramen, being a hundred per cent military organisation.

On the Egyptian and Libyan battle front there is a corps of twenty-five photographers. These men make still pictures. About thirty or forty more are engaged with cine cameras. They rank as technical sergeants; a non-commissioned expert being in a better position to mix with the men engaged in battle. They share the same risks as the fighting men.

They live, work and sleep and fight as part of the military groups to which they are attached. But at all times they have their cameras ready to hand in case the opportunity for a good action picture presents itself.

When they have taken their



Transmitting photograph by radio. At the receiving end a similar rotating cylinder to which a sensitive film is attached receives a pencil of light transmitted by radio as sound, and reproduces the light and shades of the original picture. The light travels across the revolving sensitive film until the complete negative is built up in a series of fine lines of varying intensity.

pictures—either still or cine—their films are rushed to division, packed in special bags and sent off to Advanced Army Headquarters. From there, dispatch riders carry them to airfields, from which planes fly them direct to headquarters at Cairo.

There they are taken over by a highly efficient staff, manned very largely by men who have worked in the photographic departments of our national newspapers, or in the technical branches of British and American film studios. Pictures are developed, printed and enlarged in departments which are models of efficiency.

I often wonder whether the reader of the daily morning newspaper, who sees a battle picture showing an incident that happened, say, in Libya or Tripoli during the preceding forty-eight hours, ever pauses to consider how such photographs taken on the spot in the midst of a raging battle, come from there to the breakfast table in so short a time. It is one of those things that is taken as a matter of course, and I want to interpolate here a brief description of the way that miracle is accomplished.

As most of you are aware, these photographs are transmitted by wireless. In the earlier days pictures were flown to England, but, even then, they sometimes arrived late. The installation of radio-transmission apparatus at Cairo has done wonders. The films are brought from headquarters on the field of battle to Cairo by plane, developed and printed, and then transmitted directly by radio to



An historic photograph of the momentous conference at Casablanca between Mr. Churchill, President Roosevelt, General Giraud and General de Gaulle. A photograph sent by radio to London.



The war newspaper issued only to the troops, and produced by the Army Bureau of Current Affairs, illustrated entirely by photographs with news captions.

cinema for propaganda purposes and for the dissemination of news through the medium of the illustrated papers and the cine screen.

By the appeal to the eye, photography speaks a universal language, and, with suitably presented photographs and films, is readily understood by everybody of all nationalities. This war-time application of photography is, therefore, a very important one, because, while its employment is not obtrusive, its effect is direct, convincing and lasting.

The Ministry of Information and the British cinematograph industry, although slow to start, have rapidly caught up and have, with characteristic British thoroughness, now become the leading producers of the finest type of photographic news and propaganda material in the world.

The Ministry itself provides a world-wide distribution of photographs for publication by wire, air mail, etc., through Press attachés and information officers in the various posts throughout the world. This direct distribution amounts to between 10,000 and 30,000 prints a week; the figure varies according to the news photographs available.

In addition to the Press, the Ministry provides the material for books, pamphlets, lantern slides, and all other forms of pictorial publicity, enlargements and

coloured photographs for window displays, exhibitions, etc. The M.O.I. library now contains over half a million photographs, indexed and classified, from all sources, showing the war effort, and available for a variety of propaganda purposes.

The Division has also a special loan library of over 100,000 enlargements, which serves the various needs of Government publicity, such as recruiting campaigns, Anglo-American and Anglo-Soviet co-operation, National Savings, food and fuel economy, etc. It provides displays of new photographs to over three hundred public sites per week, and is extending this service daily to factories, shipyards, building sites, etc.



British Official Photographs—Ministry of Information Travelling Exhibition of Photographs for the Salvage Campaign

Books with a popular appeal at dealing with current war subjects rank high among war-time propaganda, and of these the best are those produced by the publications section of the Air Ministry, Directorate of Public Relations. These new-style documented publications, depending entirely on photographs for illustrations, are literally modern history books and are record best sellers. The Ministry of Information is responsible for the collecting of the text and photographic material, and the books are published and distributed in this country by H.M. Stationery Office, while the distribution and translation into many different languages, for sale all over the free world, is in the hands of the Ministry of Information. Of these publications, the book, "The Battle of Britain" has achieved a circulation of well over 8,000,000, and it has been issued in twenty-four languages, including Polish, Dutch, Portuguese, Arabic, Persian, Greek, Italian, German, French, Hebrew, Russian, Chinese, Japanese, Swedish and Spanish.

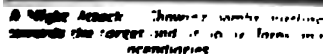
Running it close is "Bomber Command," with a present circulation of over three millions of equal distribution. Most recent books are "Front Line," "Coastal Command" and "Battle of Egypt," all of which are approaching the two million mark.

Many other books of the same category are in course of preparation, and, in every case, are fully illustrated by photography.

Exhibitions of war photographs have been a notable feature of the past year, and at Dorland Hall, London, there have been several large and outstanding displays that have gone far to tell the public what is happening on every front.

The first of these exhibitions was entitled "Allies in Action" (sponsored by *The Daily Mirror*). This depicted the Allies in action on battle fronts, on the sea and in the air, and, in particular, showed some wonderful pictures of the effect of enemy raids in this country. The pictures were all on a huge scale and were magnificent photographs. They brought home to the visitors to these shows what we are fighting for and what we have to face. Two other exhibitions of war photographs, covering a wide field, were the Red Cross Exhibition (sponsored by the weekly publication, *Illustrated*), also at the Dor-

photographic means of
has already referred to
in the case of certain



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official shows. During that week a total of 1,224 shows were given, including 408 factories and at construction sites; 230 classified as "general" shows, 226 to Civil Defence, N.F.S. and Home Guard audiences; 78 for other Government departments—Ministry of Agriculture, Ministry of Food, Ministry of Home Security and Ministry of Fuel—114 shows to women's organisations, 84 to schools, 46 to youth organisations, 22 to the Services and U.S. Army, and 16 miscellaneous shows.

Shows in factories are usually given during the lunch hour or midnight breaks, and are, therefore, fairly short, comprising two or three films, and last about twenty-five minutes. For these factory shows, films are specially produced, designed to link the work of factories to the achievements of the armed forces. In large factories as many as 3,000 workers see a single show.

Other exhibitions and propaganda are conducted, as I mentioned at the beginning of this lecture, by The British Council, which largely concerns itself with British life, but is entirely for overseas consumption.

In addition, since the outbreak of war, Messrs. Ilford have held series of attractive exhibitions at their London Galleries, in Holborn, each of which has had a direct bearing on the war, and they have all contained considerable propaganda value. At

present there is one of "War Pictures"—contributed by the British Press Photographers' Association.

These exhibitions of photographs, after being shown in London, are sent on tour to the Dominions and other countries overseas, where they continue their good work on behalf of the Allies by attracting large crowds of interested visitors.

Another show I should like to mention is one that was organised by Messrs. Kodak, for which they selected the title "Photography's Part in the War." This was opened by Lord Brabazon at Kingsway, and was later transferred to the Kodak premises, in Regent Street. It covered, in actual fact, many of the details and activities to which I have referred in these three lectures, and was organised to help their own workers to understand and appreciate what they were working for.

Also, I should like to commend Messrs. Kodak for the form of advertising they have been putting forward recently in the national newspapers, in which photography itself is being publicised for the part it is playing in the war.

There is just one final form of propaganda that must not be overlooked, particularly as it has, in many cases, an instructional element, and that is the photographic war poster, to be seen regularly on hoardings in every part of the country.

These have been issued by H.M. Stationery Office for the various ministries, and draw attention to the work of the fighting forces and to various civilian activities. The fact that they are authentic photographs gives them added value.

In addition to these, the M.O.I. is now issuing a further series of pictorial photographic posters, that are not only forceful, but for propaganda purposes will be of considerable value. The point about these is that they are circulated in foreign countries with captions in the languages of those countries.

All this is helping to tell the world what Britain is doing in the war, and it is something to know for all of us who are interested in the camera that photography is doing its job so efficiently and helping in so many phases of activity that are playing their part towards winning the war. It is good to know also that at last this is being recognised in most official quarters.

* * *

And so the tale of great achievement goes on, but it is not complete because it is not ended. But one day—perhaps sooner than we dare to think, or hope—the war will be over and won, and then the story can be told in full, and it will be one of which everyone interested in photography will be proud.

Vote of Thanks

At the close of the lecture, the PRESIDENT said that one of the stipulations which Mr. Mortimer had made was that he could not undertake to answer questions at the close of the lecture. The subject was too complicated, and, indeed, after the exhaustive presentation which he had given, members would probably have no questions to ask. It remained for him to thank Mr. Mortimer on behalf of the Society. One of his outstanding qualities was his ability to assemble from a mass of seemingly dissociated material, a concise, compact, and related story, with continuity of theme. Few people could hold an audience as Mr.

Mortimer had done that afternoon; the material had been technical, but he had presented it in an interesting and fascinating manner, in keeping with his own reputation as a lecturer.

The audience, by applause, accorded a hearty vote of thanks to Mr. Mortimer.

Mr. MORTIMER, in replying, thanked the audience for their patience in bearing with him for more than two hours. It had been a long time, but not really long enough to tell a story which had so many phases, and there was a great deal which he had had to leave out. Notably, he had made no reference to the achievements in photography of their American and Russian allies.

He hoped that if there was a fourth chapter of this story next year, it would be a retrospective one, and would deal with what photography had done during the war which had by then ended. In passing, he referred to the munificent gift by Lord Nuffield, announced that day, of ten million pounds for the formation of a Trust for science, industry, and social welfare. He sincerely hoped that photography and all that it could do would not be overlooked when the details of the Trust were being settled, and that when peace was again with the nations, photography would be firmly established in a high place as one of the essential factors in modern progress.



A Press Conference at the Soviet Foreign Office

REPORTING THE RUSSIAN WAR

Address by Miss Margaret Bourke-White

MEETING arranged by the Pictorial Group of The Royal Photographic Society was held at 16, Prince's Gate, S.W.7, on November 7th, 1942, with Mr. D. McMaster, President of the Society, in the chair.

Opening the meeting, the President said that the "one and Margaret Bourke-White" was now in their midst. It was necessary for him to say much about her work in photography, and to say something about her background. She graduated from an engineering university and went into photography the right way by trying to get beneath the skin of the subject. Long time she was on assignment for advertising for some of the American publications. Photographic manufacturers in America got to know her because she would dash in and out in motion and carry off piles of material. From coverage of industrial projects such as Boulder Dam, Miss Bourke-White became an international photographer and was sent to different places by the editors of *Fortune* and *Life*. The story she would tell to do with some of the work she did in Russia for these magazines.

Bourke-White said:—

Not going to make a speech to-day but I will talk a little about Russia and about the work I have been doing in the British Isles with the American Air Force. It is very interesting to have me come on the fifth anniversary of the Russian Revolution, because we are talking about Russia to-day; we are doing such extraordinary things. It is about eighteen months

ago that my husband and I decided that we wanted to go to the Soviet Union. I had been there before, this last visit was my fourth; my husband had never been, but as his books had been translated into Russian we were able to get the necessary passports, although it was particularly difficult to do so just then as the country was in a state of great strain and stress even if the

outside world did not realize it. Russia was not at war, it had a non-aggression pact with Germany, and it was strange that we had a "hunch" that the Soviet Union would be the next great country on the stage of world affairs. We had never believed that the non-aggression pact was anything more than a marriage of convenience, and as soon as we arrived in Russia early in May last year many things proved we were right.

You may be interested to know what the Russians really think about the British. Even though Great Britain was at war with Germany and the Soviet Union had a non-aggression pact with Germany, it was very odd that when the morning paper came out, if the man in the street saw that a British battleship had been sunk he felt very bad about it, and if he read that an unusually large number of German planes had been brought down he felt very good about it. It was very plain to us that the Russians never trusted the Germans, there were historical reasons why they should not do so. The Russians study their history and they know that in the Middle Ages the Huns invaded the Ukraine and had to be pushed out, and after the world war they invaded it again and the Russians had to drive them out, and they have not forgotten that.

It is odd how one can sense the undercurrents in a country like Russia, they come to the surface less conspicuously than in our countries—Great Britain and the United States—because not a word is allowed to appear in the Press indicating this strain. But one gets the feeling of what is going on often by the anecdotes people tell. There was one story about Hitler. He went to the edge of the English Channel and looked longingly across the water and deciding that the ditch is a little too wide, that he needs expert advice. He called the eldest Rabbi to come and consult. Hitler explains his problem and the Rabbi says, "It is not so very difficult. Moses had the same problem and he handled it very easily." "What did Moses do?" asked Hitler. The Rabbi said, "He picked up a little stick and struck the waters with it and everything was handled." Hitler said, "That is just what I want to know, where is that stick?" The Rabbi answered, "It is in the British Museum."

During the days of 1941 we were travelling by the Black Sea and visited a lot of the towns which have been captured now. We went through the area where they grow the real Ukrainian wheat and stayed

who could speak it I, was General Mason head of the British mission. He began to to the children and to phrases, and we suddenly at they were arguing for of putting out the next

first night the Germans which was the 22nd July, month after the invasion, to hit the Kremlin; they ceed, but they did a good ving up the Italian and mbassies.

the most interesting parts of is the opportunity I had of phing Stalin. Stalin is e least accessible person d. I had tried various o get permission, but ccess; then Mr. Harry me to Moscow, whom I se I had photographed ashington. Mr. Harry as popular in Moscow, ecause he looks like a

He asked for an appoint- ne and, finally, I was otograph Stalin. I had to go to the Kremlin at notice, and wondered ould wear as I had not s with me. The Russians I wore a blue suit with a shoes and put a red bow I got very nervous while eing afraid my lenses work, my synchronizers work, so I cleaned them t everything set. The car came for me and I to the gate, soldiers came ery turn in the road there rs who let me through g in the car to make sure he person they had been et, and I noticed that my t travelling alone, but car before and behind.

ast to a little triangular t the centre of the big old officers lifted my equip- got into a gilt elevator arted walking down the idor I have ever seen. s were set at oblique ilst we were walking, I o plan my picture, trying Stalin. One gets curious

Stalin. Everywhere in there are huge statues s of him, in the squares, ad even in the shops, and e must be a giant. At ned his room and it was a re I saw him. I looked up to the ceiling, then eyes to the floor and him, and I found he was I am. He is wrinkled,

his hair is a little grey, his moustache has a chewed-up look. He looked rather tired. He was plainly and neatly dressed, but I decided that he had the strongest face I had ever seen in my life. He looked as though he were carved out of a piece of granite.

I talked to him a little while I was arranging the cameras, and started to take pictures, but I could not alter that face of stone and I wondered how I was to make him relax. Then I was crawling on my hands and knees, handing flash bulbs to the official interpreter, and that amused Stalin, and he began to laugh. He had an entirely new expression, one that I wanted. Finally, I finished the work, took my leave, and walked again down the long corridor.

There is a curious custom in Russia that never on any account does anyone use the elevator to go down, but I wondered if I should be able to go down in the lift in the Kremlin. However, the officer took me firmly by the elbow and led me down the staircase.

I wanted to go to the Russian front. It was very difficult to get to the front. At that time even the British general had been for only four hours, and our United States military attaché had never been. I kept on working and, finally, in the autumn, just at the time the Germans were starting their push against Moscow, we were allowed to go. We had a very interesting trip. I had never realized what a front looked like, and I was amazed to find how much happened under groups of trees, and we travelled from one group of trees to another. When we came to these beautiful little groves, I would

believe that there was not a living person for miles, but they were hives of activity. There were soldiers talking through field telephones, sometimes a tank dug into the ground was used as a fortress, aeroplanes were pushed under the trees and some of the little airports were particularly interesting, because the Russians have a clever way of picking out a little spot in the fields which would make an airport, cutting down a nearby grove and sticking the trees in the ground and moving them away when the planes took off, and then moving them back.

We spent a week travelling within an average distance of three miles of the Germans. We talked with the soldiers and officers, and I was specially interested in talking to various scouts whose job it was to get contact with the guerilla forces. Their work has been remarkable, and is one of the reasons why the Soviets have done so well. After the country is captured the people go on fighting, and books on the art of sniping and guerilla warfare have been previously sent out so that the inhabitants knew in advance what they were supposed to do. The roads are not choked with refugees in Russia; the people stay behind where they can annoy the enemy. I talked with scouts who had come back from one village where the peasants had decided to tear up the railway tracks. The villagers went out at night, tore them up and the children carried the rails and threw them in the swamps. In another place burning logs and flaming trees were flung across the tracks, and when the munition train came along the villagers began sniping at the Germans; when they had used all their ammunition they threw rocks at them.

At another village the men hid in the woods when the Germans came, leaving the women and children behind. The Germans set up headquarters in a little log school, and during the night the women set fire to the school and when the officers rushed out they set on them with pitchforks. I remember particularly a girl called Tania. At night she put on her side arms, crawled through the grass until she got behind the German lines to get information. She knew every bit of the country and was able to do this work and get back by daylight. She gave her report, had some sleep and then went to the hospital tent to care for the wounded.

We spent a night at a little hotel at Vyazma, and there was an air raid while we were waiting to start the next morning. The Censor, who was still in bed, had the window frame of



Miss Margaret Bourke-White

his room blown over him. I grabbed a camera and went into the street. The air was filled with flying dust, and when the smoke cleared I saw something moving in the cloud and found that it was a little white dog. I picked him up and then saw something more important, a family which was lying perfectly still. I got to work and photographed them, and while I worked the mother came out and saw that her son and daughter were killed. I felt a little heartless, but a photographer must record things as they happen.

The Germans were bombing the road along which we were travelling, and we had to leave the cars every now and then and rush off into the fields, and the first time we did so I noticed I was in the biggest field of blue gentians I had ever seen. When the planes had gone I picked handfuls of the blue flowers, but the soldiers were more practical and tore the shrubs out to camouflage the cars. When the little convoy moved off we looked like moving Christmas trees.

From some huckleberry bushes, which looked as though they had been grown to cover war correspondents, we watched a little village being deliberately pounded to pieces. It was completely destroyed in a very short time. At the end of the trip we arrived at the town of Yelnya, just about a year ago. It had been the scene of very severe fighting. There was nothing left except a few chimneys pointing to the heavens; there was hardly a building where there were two walls standing together; it had changed hands back and forth until the Russians had got it back. Although it was almost completely destroyed, people were creeping back and setting up their homes in the middle of the ruins.

Nearby there was a large battle field which looked like the end of the world. The whole area was pitted with shell holes, it was scarred with trenches, and at the bottom of the trenches there was a lot of dead men's helmets and all kinds of debris.

When we returned to Moscow we had one more important matter to decide, whether we were going back home by way of the Arctic Ocean or by way of Australia, which sounds a very fantastic choice. We came back from the Arctic by British convoy, arranged for us by Sir Stafford Cripps; there were 22 ships with us. As we went through the White Sea we had German planes above us, but it was so foggy that they could not find us, nor could we see them to fire at them. I stood on the deck with the camera for hours hoping the light would not be too bad for photography if something happened. We sailed through

literally seven seas until we came to the British Isles. I was interested in the way the convoys worked, and was fascinated to find that no one knew when they were going, or where, not even the commodore. The crew had been told to take light clothing; just before they left they were told to take heavy clothing, and three days after they were out they were told they were going to Archangel. Every hour the Admiralty directs these convoys; the ships listen but do not reply. The Admiralty directs every convoy of the many travelling over the oceans of the world. We travelled in a weird kind of light, but it never got quite dark, even during the long nights of winter. We were there just about this time last year, and the nights were very long; always there was this peculiar glow over the sea. Even at night we would walk around the decks and see the little figure of the commodore on the bridge, wrapped in a kind of cloak with a hood. He looked like a "bunny" going round the deck, straining his eyes and ears to see if all his ships were there. Before we got to the British Isles we lost one. It just disappeared, and we did not know what happened to it. I was here ten days, then I went back to America, and now I am back again.

I would like to tell you a little about my work with the American Air Force, because it has been an inspiration to me to watch these young men at work, although anything I tell you would be the same for your R.A.F. I have seen much of your people, because we work very closely with them. There is something about a war which seems to change everything, but the most interesting and the hardest to photograph and to talk about is the

remarkable amount of co-ordination which has developed. I often find that most jobs in this war are not done as well as they should be, but during a war people do their jobs as well as they can, and with these men a type of skill and co-ordination has been developed. I am interested particularly because I am curious about the kind of grounds people come from, and I have spent a good deal of time with the crews. They are not all mechanics; there will be a shoemaker who used to be a shoe salesman, a radio officer who would have some training in a radio set, a farmer who might have sold space in the advertising business, a turreter who would have driven a fruit truck from Florida to New York. A farmer might have been a farmer in a small town. After all, I am an American, and I know this type of people very well, what they can do, although I have spent some time with the bombing crews I don't know how they do their work so well. The planes are good, the air discipline is very interesting.



Air Raid Warden at Entrance to Shelter

turning very interesting things, re learning all the time. They o keep their guns clean, every day the boys clean their guns; a very specialised job—they not be oiled too much because high altitudes. Strange things a to guns at high altitudes, but boys know that they have to do nple job of cleaning and caring ir guns just as well as it can be

i impressed by the comradeship grows up between these They know how much they unt on each other; it is as if ecome a definite physical unit; re plugged into the ship for dio, oxygen, for heat and so ey can talk. It is very striking when I realise the simple back- is which they have had—how tly they can operate.

ant to tell you about a very nt thing that happened to me. lay I was standing in the i' mess and one of the crews me to name their 'plane. The ans have very 'jazzy' names eir 'planes; one of the most is the "Red Gremlin," some- which is borrowed from R.A.F. logy. Gremlins are the little which get into the 'planes and everything go wrong. When boys asked me to name their I was afraid I would not find a hey would like. The navigator ice fellow with red hair and s, who comes from Florida. d to be a salesman for Kraft and when he went into the he was astonished to get a e containing cigarettes and a of sermons signed by J. F. himself. The boy was simply l that "J. F." remembered Just before he left Florida he gaged, but left America before ld be married. He hoped his ould be waiting for him, and pes that J. F. Kraft would be for him when he got back. me I finally picked, and that w picked out of my list of five, ot mean much to you. In a when we have too many toes we use a flit gun, and the names I suggested was 'lying Flit Gun," which they

there had to be a christening. know, everything in the army go through channels. First of had to arrange what we were o christen it with, and as we champagne, and since wanted ing to be thoroughly Ameri- e decided to use a bottle of ola, but according to the rmaster, a bottle of Coca-Cola n-expendable item; we could

drink it, but not smash the bottle. However, he gave us permission to smash it, then the Armament Department was called in for a report as to how much damage I should do if I smashed it on the nose of the 'plane, and they decided that one of the front guns should be strong enough to stand up against a Coca-Cola bottle. Then the Weather Department had to be consulted, and weather is the most secret thing in the Air Force, so behind closed doors a day was selected for the christening. It had to be a delicate balance of weather; it had to be just good enough for the christening party not to be rained on, and just bad enough so that the guests would not be called off on bombing. Then Intelligence Department had to be called in to write the speech, and they wrote a wonderful speech in blank verse. The great day came off, the 'plane was wheeled up,

all the guests went out. I set up cameras all over the place for the "jeep" boys to take the photographs. The Commanding Officer blossomed out with gestures and read his speech magnificently, I smashed the bottle, and the "Flying Flit Gun" was christened.

The next day there was a bombing run and they had a very heavy time and the "Flying Flit Gun" shot down an F.W. 190—about which the boys were, of course, very pleased.

Asked about methods of development in Russia, and the type of equipment she used, Miss BOURKE-WHITE said that here she did not do her own developing; everything was very luxurious and easy but in Russia there were no such facilities, and she did develop herself by tank and temperature methods. She used mostly quarter-plates and carried a supply of DK 20 with her, and when



Poster Artist with Stencil



The Stairway of a typical Crèche

she ran out of it got some so-called fine grain developer in Russia, which was quite satisfactory. The toughest time was when the air raids started, because the Russians were very strict about people going into shelters, and it always happened that as soon as she started work the alarm sounded and she had to dive under the bed until the hotel wardens had been round, and her husband had to hide under a big white bearskin rug, but the serious part was that she had to lie under the bed counting seconds and minutes, hoping her films would not be too over-developed by the time the wardens went away.

As to the cameras, in Russia she used a Linhof $3\frac{1}{2} \times 4\frac{1}{2}$; she liked its flexible qualities, the tilting front and tilting and twisting back. She had

many lenses, and everything was interchangeable; each lens had its own synchronizer magnet because she loved flash bulbs. The Linhof was her standby, but she always carried a Speed Graphic, and also used a Reflex, and this year she bought an English Soho. She was very hard on cameras. She also used a Rolleiflex. For aeroplane pictures she used a Fairchild camera, which was easy and satisfactory to use.

Another questioner asked if she came into contact with any of the Russian cine camera men, and she replied that she did, and gave news of the activities of several of the well-known Russian workers, most of whom were engaged on propaganda film work.

Asked if she ever used 16 mm. cam-

eras, she said she had used a 16 mm. which she thought was a wonderful little camera, but she had no feeling for miniature cameras. She was happier with a somewhat larger film size. The only synchronizer which she was satisfied with was a group of engineers in Denver who was very reliable. Before leaving she had got them to give her a letter repairing and re-adjusting it.

In reply to another member's question, she said that the Russians were not very particular about colour, especially in cinematograph films, but she was not very keen on it at first-hand as she had not seen it. Nearly all the work was 35 mm., and they used the Leica a very great deal. The Russians were doing a great deal of work with colour, which would doubtless produce some very original work. She did not know what process was being used.

The PRESIDENT proposed a vote of thanks to Miss Bourke for her fascinating and extremely human story. It would not be to say that they had met a camerawoman in photography that afternoon, but they had not only enjoyed the story but had been charmed by the personality of this celebrity.

The vote of thanks was a unanimous one by prolonged applause.

The illustrations accompanying this report are reproduced by courtesy of the publishers of Miss Margaret White's book, "Shooting the War," Messrs. Simon and Schuster, New York, Messrs. Hutchinson, London, publishers of the English edition of the Proprietors of Life magazine, New York.



Artillerymen

EXHIBITIONS AT PRINCE'S GATE



NIGHT HERON

CAPTAIN G. K. YEATES, F.R.P.S.

PHOTOGRAPHIC PROGRESS IN 194

By Glenn E. Matthews, F.R.P.S.[†]

PHOTOGRAPHY played an important part in the mighty drama of a world at war. Photographs and motion pictures did their bit to help meet the problem of total production, in order to supply the fighting forces of the United Nations. Probably the most graphic impression on the general public of the progress of the war was made by the hundreds of photographs published daily which were chosen from many thousands of pictures taken by photographers on the active battle-fronts throughout the world. (Fig. 1) In the theatre, the sound newsreel brought home still more forcibly the tragic drama of the leading happenings of the war. The greatest value of photography, however, was realized from its employment by the military forces to train men more quickly to use mechanised weapons of modern warfare and to record the details of the enemy's land, sea and air fortifications, so that our troops and navies could attack them more effectively.

The United States Army Signal Corps, the Air Force and the Navy were responsible for the bulk of the photographic work of the American armed forces. Aerial photographs were taken by the latter two services, and all three used still photographs and motion pictures.

About two years after the Signal Corps was designated, in 1928, as the official agency charged with the production of training films and other visual aids, a programme of specialised instruction in the fundamentals of sound motion picture production was arranged for selected officers at the motion picture studios on the west coast. This training programme was planned in close co-operation with the Research Council of the Academy of Motion Picture Arts and Sciences, who also assisted subsequently in the production of many of the training films used by the United States Army. The photographic service of the Signal Corps was known as the Army Pictorial Service. It had three divisions, as follows: Motion Picture Production, Pictorial Administrative, and Field Activities. Centres of photographic production for the Signal Corps were located at

Astoria, L.I., Fort Monmouth, N.J., and Washington, D.C. The property at Astoria, L.I., was a re-constructed motion picture studio, which was owned at one time by Paramount Pictures. Functions of the photographic service of the Signal Corps included supply and procurement of still and motion pictures for historical records, legal evidence, training, identification, and photomail service; custodianship of permanent photographic records of the Army, in conjunction with the Archivist of the United States; combat photographic service for the Army Ground Forces; production and distribution of training films, film strips and orientation films for all agencies of the War Department; and other miscellaneous duties (*Radio News*, 28, 74, November, 1942).

Approximately 450 training films were reported to be in use at the close of the year. Nearly every important phase of army training was covered

by these films, and many others said to be in production. It was a regular practice to photograph production on 35 mm. panchro film and, after a master print had been approved by the General, the major number of the distribution prints were made on 16 mm. All standard prints were sound in black and white; sound film colour were reported to be under consideration for specific subjects. The use of these films was said to have affected a 40 per cent decrease in total training time (*Bu Screen*, No. 5, 14, 1942). Detailed methods used for sound record training films were described by Gillette (*Radio News*, 28, 98, November, 1942). Narration, live effects, and music were introduced required when making the negative.

The production centre of training films for the United States Army Forces was Wright Field,



Fig. 1. The Battle of the Coral Sea. Upper view shows U.S. Navy torpedo plane veering off after dropping aerial torpedo (white splash, right centre), intended for Japanese aircraft carrier *Ryukaku*. Lower view shows torpedo hit on the big Jap ship.

Credit: Official U.S. Navy Photo

* From the New International Year Book, 1942, Funk & Wagnalls Co., New York, N.Y.

† Technical Editor, Kodak Research Laboratories, Rochester, N.Y.

Dayton, Ohio. Here was located the Signal Corps Training Film Production Laboratory, where special films were being made to train the great army of more than two million airmen for specialised work on the air fronts of the world. The organisation of this production laboratory was described by Brecha at the 1942 Autumn Meeting of the Society of Motion Picture Engineers (*J. Soc. Mot. Pict. Eng.*, **39**, 348, December, 1942). Capacity of this laboratory was estimated as one million feet of film per month.

Newhard gave a brief account of various uses of the motion picture camera in the U.S. Army Air Forces. All tests that were too fast, too complicated, or too remote for accurate visual observation were being studied by photography. Several of the subjects recorded were stresses and strains on airplane parts during flight manoeuvres, characteristic trajectories of various types of bombs, movement of different parts of planes during wind-tunnel tests, and analysis of the performance of experimental parachutes (*J. Soc. Mot. Pict. Eng.*, **38**, 510, June, 1942).



Fig. 2a. The R.A.F. method for photographing low-level raids. Camera projects through floor of aircraft nose. Mirror over end of camera reflects area behind and below the plane. Credit: British Official Photograph, Ch. 4755. Air Ministry Photograph, Crown Copyright Reserved



Fig. 2b. R.A.F. "most-high daylight attack on Rotterdam." Type of photograph taken with aid of camera fitted with mirror before the lens. Credit: British Official Photograph C 2047. Air Ministry Photograph, Crown Copyright Reserved

The extremely cold conditions encountered at high altitudes necessitated the design of heating units to ensure smooth operation of aerial cameras. One simple plan utilised the warm air from the engines, while others used electrical heat in the form of a blanket or as fine wires across the camera lens. Special processing equipment was introduced to handle the long lengths of film under the confined spaces available in field equipment. Adverse conditions of heat and cold encountered in such remote spots as Guadalcanal, in the Solomon Islands, and in Dutch Harbour, in the Aleutian Islands, presented difficult problems in connection with the development and printing of film.

More extensive use of colour photography was said to have been undertaken by the Air Forces, and very satisfactory colour photographs were reported to have been made with new materials at altitudes up to 30,000 feet (*Science News Letter*, **41**, 243, April 18, 1942).

Laws gave a detailed account of the photographic equipment and methods of the Royal Air Force. Much of the photography was done with a modified F-24 aero camera, which was designed in the form of six units, to make it more adaptable to varied requirements. Lenses ranged in focal length from $3\frac{1}{4}$ to 40 inches, and the most common negative size was 5 by 5 inches. For low altitude flying photographs could be taken with a vertically-mounted camera of targets that the plane had flown over. This was done by using a mirror attachment mounted at 45 degrees in front of the lens (Figs. 2a and 2b). Most of the R.A.F. films were developed and printed in ground laboratories or in trailers staffed by men and women technicians. One special type of camera contained its own film developing unit, which permitted development of a negative in $1\frac{1}{4}$ minutes after exposure. Improved panchromatic and infra-red films were known to be in use, and excellent night photographs were reported to have been made (*Flying*, **31**, 134, September, 1942). Candidates for flight, as well as ground crews of the Royal Canadian Air Force, were being trained with the aid of motion pictures (*Amer. Cinemat.*, **23**, 54, February, 1942).

The United States Navy Bureau of Aeronautics, with headquarters in the new Aeronautics Laboratory, at Washington, D.C., was in charge of the photographic requirements of the Navy. The Navy's training school for ship and aerial photographers was located at Pensacola, Florida. Each of the Naval Districts of the United

States, and certain ships of the fleet, had its own photographic unit. These units were charged with many duties, including records of all new equipment, pictures of ships damaged by enemy action, reconnaissance photographs for use by the staff officers in planning the strategy of battle, and action pictures taken during sea or landing engagements. Taylor described the course of instruction given naval photographers and the equipment required for their use (*Phot. Trade News*, **6**, 16, March, 1942). A comprehensive programme of audio-visual instruction was being used by the U.S. Navy for the tremendous job of training several hundred thousand men for the rapidly-expanding "two-ocean" navy. Films were stated to have many advantages, such as an aid to standardisation of instruction and improvement in clarity of complex subjects, and they represented a useful supplement to the instructor, who may have a thorough knowledge but lacks pedagogical experience (*J. Soc. Mot. Pict. Eng.*, **38**, 501, June, 1942; *ibid.*, **39**, 333, December, 1942). The technique of the animated cartoon was being used extensively in many training films, particularly for subjects which were very difficult or impossible to photograph. More than 50 of these films were being made for the Navy by the Disney Studios; examples of the titles were "Rules of the Nautical Road," "Thunderstorms," and "Fog and Ice" (*Life*, **13**, 61, August 31, 1942).

Many remarkable photographs and motion pictures were made during the battles of the Gilbert and Marshall Islands, Midway Island, and the Solomon Islands (Fig. 3). Shortly before the American aerial attack of February 24th on Wake Island, several excellent aerial reconnaissance photographs were made by an army bomber. The films were flown to Pearl Harbour, to be developed and printed; then delivered by air at sea to the aircraft carrier which had left with its task force several hours previously. With the aid of the photographs, a successful attack was made on the Japanese installations on Wake, with resulting heavy losses to their airplanes and equipment (*N.Y. Times*, **91**, 6, June 24, 1942) (Fig. 4).

One of the first jobs of photographic reporting of the war was the 16 mm. Kodachrome record of the battle of Midway Island. The edited film was enlarged, with printed-in commentary and sound effects on 35 mm. Technicolor film, for public release. Commander John Ford, U.S.N.R., was in charge of the photographic crew who made the

pictures. During the action, two of the cameras were destroyed by concussion, and the other two cameras were blown out of the men's hands several times. Air and sea pictures were made by another officer and two men attached to Commander Ford's unit. This picture was said to be the first colour motion picture of a major land and sea engagement.

Colonel Daryl F. Zanuck, U.S. Army Signal Corps, with motion picture cameramen of the Signal

used in lighting the scene to secure the greatest illusion (*Popular Phot.*, 11, 20, October, 1942).

Civilians Instructed with Aid of Photography

The enormous task of training several hundred thousand workers for special skill in numerous war plants throughout the nation was facilitated by the use of photographs, slides and motion picture films. In one group of fifty training films, subjects covered included lathe operation, milling machines, drills, shapers, and welding. The U.S. Bureau of Mines circulated films on the machining, welding and riveting of aluminium,

the motion picture industry for free distribution to theatres.

Colour Photography

Amateur photographers who were interested in colour photography made their pictures largely by the Kodachrome process, which was introduced in 1935. This method gave a small transparency, which could be projected for viewing, or enlarged on a semi-opaque safety film support, as announced in 1941. During 1942 improvements were effected in the enlarging technique, permitting 8 by 11 inch colour prints to be made on regular order to the manufacturer, and still larger prints,



Fig. 3. Photo series showing a Japanese twin-engine bomber attacking a U.S. Navy Carrier

Fig. 3a. Leader of Jap squadron badly hit starts shallow dive toward carrier, apparently bent upon liquidating personnel on bridge by machine gun and cannon fire



Fig. 3b and Fig. 3c. As bomber approaches carrier, note that left engine has been partially shot away



Corps and O.S.S., photographed the North African campaign between November 7th and December 5th, 1942. This picture, with narration, was shown in Technicolor at Washington, D.C., January 25th, 1943, and is considered the outstanding combat picture yet produced.

Several unique photographs were released of sinking Japanese warships and freighters, as seen through the periscope of an American submarine (Fig. 5). Stanning described various methods of making such pictures (*Popular Phot.*, 11, 29, December, 1942).

Very realistic table-top photographs of battles and battlegrounds of the present war were designed and photographed with great accuracy by Norman Bel Geddes, well-known designer of miniature sets (Fig. 6). Details of sea battles were supplied by the staff of *Life* magazine. Models were made to scale and placed on an expanse of an artificial ocean, on a low platform, measuring about 18 by 20 feet. Extreme care was

which aided considerably the training of workers in the airplane industry. Colour motion pictures were used to explain the sequence of operations in the manufacture of shell cases. Over 2,000 copies of a film on arc welding were in use in the United States alone, as well as additional reels, which were sent to England, Canada, Brazil and South Africa (*Chem. and Eng. News*, 20, 1317, October 25, 1942).

Many of the phases of civilian defence were taught with the aid of photography. These included first aid, auxiliary police and firemen, defence against gas attack, air raid protection, and decontamination squad work. Information on the progress of war production was filmed to acquaint the public with certain aspects of this work. Several of the titles of these films were "Power for Defence," "Bomber," "Aluminium," "Ring of Steel," and "Women in Defence." These pictures were released by the Bureau of Motion Pictures of the United States Office of War Information (*Business Screen*, No. 5, 19, 1942). Numerous short subjects and trailers were prepared by the War Activities Committee of

to a maximum size of 30 by 40 inches, on special order.

Great interest was also shown in the new Kodacolor process, which resembled, to a certain extent, ordinary black and white picture technique in that a negative was produced from which the prints were made on paper. The negative contained colours complementary to those of the subject. Technical details were announced in December, 1941, and were included in last year's report (*New International 1942 Year Book*, p. 517; *Phot. J.*, 82, 223, 1942).

A colour transparency process, known as "Ansco Color," was made public in July, for which it was claimed that the amateur could develop his own films. It was stated that the new process would be commercially available after the war.

Professional photographers continued to make their colour prints by several well-known methods, such as Carbro, Chromatone, and Wash-off Relief. In connection with the last-named process, Smyth published details on exposure and quality control when making prints from Kodachrome transparencies (*Amer. Phot.*, 36, 12, June, 1942). Professional

Kodachrome film was used more extensively than other materials for commercial colour photography. A direct-positive (reversal) paper was used to some extent when checking the exposure for Kodachrome film.

Several feature motion pictures were made in Technicolor during the year; one of the most beautiful of these was "Bambi," based on the book of the same name. "Bambi" was made by the Disney animation process, with music and spoken dialogue added. Stereo perspective was used for many of the scenes by photographing them on the multi-plane camera. The Technicolor

A further series of patent reviews of colour photography processes was published in the *British Journal of Photography*, under the title of "Colour News," and in *American Photography*.

Motion Picture Photography

The number of feature motion pictures and short subjects produced by the major studios in this country and Great Britain was reduced considerably compared with previous years. This curtailment came about in two ways: (1) as a result of an increase in the use of studio facilities to make films needed for the war

than the sound made by reduction-printing from 35 mm. records (*J. Soc. Mot. Pict. Eng.*, **39**, 135, August, 1942).

Great progress was made in the motion picture industry of the Soviet Union, according to Irsky, who reported on the improvements made in the technical facilities over the past decade (*J. Soc. Mot. Pict. Eng.*, **38**, 532, June, 1942). Irsky also discussed the production of documentary, scientific and military films, under the extremely difficult war conditions, where factories have had to be moved to new localities, as a result of enemy occupation of the country (*J. Soc. Mot. Pict. Eng.*, **39**, 353, December, 1942).

A few of the many serious problems facing the motion picture industry in China were described by Lo. For protection against Japanese bombings, several divisions of the studios at Chungking were built in tunnels underground, and, during air raid alarms, equipment and portions of sets had to be carried into these dugouts. Apart from the 112 theatres in Free China, ten mobile projection units were organised to show pictures to troops near the front and to the people who lived in remote villages (*J. Soc. Mot. Pict. Eng.*, **39**, 341, December, 1942).

In October, the National Academy of Cinematographic Art and Technique was inaugurated, in Mexico City, by a special decree of the President, backed by the government and by industry (*Mot. Pict. Herald*, **149**, 32, November 7, 1942).

Careful attention was given by various committees to the problems of war-time conservation in connection with theatre projection (*J. Soc. Mot. Pict. Eng.*, **38**, 515, June, 1942). The defence programme of the motion picture theatre was discussed by Anderson (*J. Soc. Mot. Pict. Eng.*, **38**, 526, June, 1942).

Applied and Scientific Photography

The first college to offer an academic degree in photography was Ohio University, which announced that students would receive the degree "bachelor of fine arts" in photography, provided they completed satisfactorily a prescribed course of study, which included theoretical as well as practical subjects (*Amer. Phot.*, **36**, 56, October, 1942).

Details of the structure of matter never seen before were revealed with the aid of the electron microscope and photography. Jelley published photographs showing the structure of the developed silver image as given with several different devel-



Fig. 3d. As captain of carrier turned his ship to avoid collision, Jap bomber appeared to hesitate, then plunged into the water about 200 feet distant



Fig. 3e. Violent explosion of enemy bomber. Photographs are enlargements from a motion picture made by a young Pacific Fleet bluejacket

Credit: Official U.S. Navy Photograph

Corporation stated during the year that they were using 16 mm. Kodachrome film for some of their studio photography, and then making a Technicolor print from the Kodachrome film. Another important announcement was the limited employment for production of a monopak (Kodachrome type) 35 mm. film in place of the usual three-strip method. Separation negatives were prepared from the resulting colour transparency. The final Technicolor prints were said to be very promising, although not quite as good as those with the older three-strip method (*J. Soc. Mot. Pict. Eng.*, **39**, 96, August, 1942). Details of equipment problems encountered when making aerial Technicolor pictures were described by Dyer (*Amer. Cinemat.*, **23**, 60, February, 1942). Crespinel discussed the enlargement of 16 mm. Kodachrome film to make 35 mm. Cinecolor prints. A three-colour sequence in the United Artists' feature release, "The Moon and Sixpence," was made in this manner (*Internat. Phot.*, **14**, 10, October, 1942).

effort, and (2) because of a sharp cut in film stocks available for making entertainment films.

A very comprehensive symposium on the technique of motion picture production was held in Hollywood, California, in May, by the Society of Motion Picture Engineers. A list of the subjects discussed included the following: Camera Equipment, Set Lighting, Laboratory Practices, Production, Sound, Scoring and Pre-scoring, Re-recording, Cutting and Editing, Photographic Embellishment, and Projection (*J. Soc. Mot. Pict. Eng.*, **39**, 83 et seq., August, 1942).

Definite improvements in the design of 16 mm. cameras for professional work and in sound recording equipment for 16 mm. film, as well as improved emulsions for picture and sound, resulted in a wider use of 16 mm. film for studio and for commercial photography during the past few years (*Amer. Cinemat.*, **23**, 442, October, 1942). The quality of sound recorded directly was said to be very good, and in some cases, for industrial motion pictures, better



Fig. 4. Reconnaissance over Wake Island. This aerial photograph shows enemy installations, enemy positions and defences. The picture made over Japanese-occupied Wake Island during early phase of Pacific War

Credit: Official U.S. Navy Photograph

opers (*J. Phot. Soc., Amer.*, 8, 283, June-August, 1942). Identification and characterisation of certain bacterial viruses were shown to be possible with the aid of the electron microscope by Anderson and co-workers (*Proc. Nat. Acad. Sciences*, 28, 127, April, 1942; also *J. Exptl. Med.*, 75, 651, June 1, 1942). (Fig. 7). A new, less expensive, model of the electron microscope was announced by Zworykin, in November (*N.Y. Times*, 92, 18, November 27, 1942).

A very comprehensive plan of microfilming the mail going to and coming from the men and women of our armed forces in distant lands was started in July, and by autumn of the year standard letter forms were available in every post office in the United States, as well as in Alaska, Hawaii, and most of the other remote locations in the world where American troops had landed. This plan, known as the V-Mail system, was developed by the Eastman Kodak Company. It provided for microcopying all letters on to 16 mm. film and sending the film rolls by rapid transportation,

many months, or perhaps years, earlier than it could have been done otherwise. This was the Seventh Symphony of the Russian composer, Shostakovich, which was said to have been written during the siege of Leningrad in 1941. A total of 252 pages was copied on to 100 feet of 35 mm. film, and then flown most of the distance, 10,000 miles, from Kuibyshev, U.S.S.R., to New York, where the symphony was given its premiere in America, at the N.B.C. Studios, under the direction of Toscanini (*Life*, 13, 35, August 3, 1942) (Fig. 9).

A photographic unit, especially designed to make Photoflash pictures on Kodachrome of body cavities was described by Brubaker and Holinger (*J. Biol. Phot. Assoc.*, 10, 83, December, 1941). General roentgenographic examination of members of the armed forces was extended during the year. An analysis of the suitability of available methods by de Lorimer indicated that the choice was stereoscopic 4 by 5 inch photo-roentgenograms (*Radiology*, 38, 462,

usually by airplane, to a location relatively near the addressee. Each 100-ft. roll contained about 1,500 letters. For transmission to the addressee, each tiny letter was enlarged photographically to one-half the original size (Fig. 8). The same system was organised in 1941 for use between British troops in the Near East and England, and during 1942 it was extended to many parts of the British Empire ('Air-graph').

The use of microfilm made possible, in July, the playing of a great symphony usually by airplane, to a location relatively near the addressee. Each 100-ft. roll contained about 1,500 letters. For transmission to the addressee, each tiny letter was enlarged photographically to one-half the original size (Fig. 8). The same system was organised in 1941 for use between British troops in the Near East and England, and during 1942 it was extended to many parts of the British Empire ('Air-graph').

The application of high-speed photography to industrial problems was discussed by Eyles, who included a comprehensive bibliography with his article (*J. Sci. Instruments*, 18, 175, September, 1941, reprinted in *J. Brit. Kinemat. Soc.*, 5, 114, October, 1942).

Physical Measurements

The control of photographic printing by measured characteristics of the negative was investigated and reported in a comprehensive paper by Jones and Nelson. Psychophysical statistical methods were used to study the problem, and many thousands of prints were judged for quality by a number of observers to determine the best print. It was found that the shadow density of a negative is a more reliable guide for determining correct printing exposure than the highlight density. As a general rule, it was stated that "a negative should be printed so that its minimum density falls on the shoulder of the *D-log. E* curve at the point where speed is measured" (*J. Opt. Soc. Amer.*, 32, 558, October, 1942).

A revised list of the recommended practices of the Society of Motion Picture Engineers was published in May. These recommendations, covering many diverse subjects, such as camera and projecture apertures, projection reels, cutting and perforating film stock, etc., are submitted from time to time to the American Standards Association and, if approved, they become either an American Standard or an American Recommended Practice (*J. Soc. Mot. Pict. Eng.*, 38, 403, May, 1942).

Useful data on the optical and mechanical characteristics of 16 mm. motion picture projectors were prepared by Stephens. It was suggested that these data could be used in the preparation of specifications governing the procurement of pro-

jectors (Circular No. C437 Nat. Bur. Standards, 1942). Information was published by Snyder on the acoustic performance of 16 mm. sound motion picture projectors. Measurements on representative equipment were made, and improvements in such apparatus were suggested (Circular No. C439 Nat. Bur. Standards, 1942).

The British Standards Institution issued a set of exposure tables in 1941 (B.S.S. 935) for general use by photographers, particularly those in the British armed forces. The preparation of the data for these tables was described by Berg, who showed that reasonably consistent exposures on any one subject could be obtained throughout the year (*Phot. J.*, **82**, 107, April, 1942).

Investigations concerning practical sensitometry of photographic papers were published by Romer and Rajski (*Phot. J.*, **82**, 66, March, 1942), and "The Contrast or 'Printing Capacity' of Photographic Papers," by L. V. Chilton (*Phot. J.*, **82**, 151, April, 1942).

Manufacture of Sensitised Materials

New sensitised materials were confined almost exclusively to the requirements of the Government, and information on the nature of these developments would probably not be released until after the close of the war. Much of the equipment of photographic manufacturing plants was converted to the production of instruments and parts for use by the armed forces. Range finders, firing mechanism, height finders, and optical and mechanical parts for ships, tanks, guns, and airplanes were being built in quantity to satisfy ever-growing quota needs. As the year progressed, more and more of the sensitised materials and equipment were allocated to military use, and a corresponding reduction took effect for civilian purposes. Manufacturing plants were guarded, and every employee was required to wear or carry a photographic identification badge.

As a direct result of the restrictions imposed on all users of metal products, manufacturers requested customers and dealers to return all metal film reels, packs, and motion picture reels for re-use.

A fast, moderately fine grain panchromatic film having high green sensitivity was introduced for Press photography. The use of matte transfer film for the making of photographic templates or patterns by the aircraft industry was displaced to a great extent by a matte transfer paper. In like manner to the method of use of the former product, transfer

paper was coated with an emulsion layer which could be dry-stripped and laminated on to metal, wood, or other suitable sheet material. Patterns were then printed on the laminated sheet, and, after processing, were cut up for use as templates.

Several firms supplied new fine grain X-ray films for industrial radiography, which were used extensively for the examination of metal parts of equipment. Trends in the technique of industrial radiography were discussed by Seemann (*Amer. Soc. Test. Mat. Bull.*, No. 115, 21, March, 1942; *Engineer* [London] **174**, 492, December 18, 1942). A new X-ray paper, called "Kryptoscreen," incorporating its own intensifying screen, was marketed in England (*Nature*, **150**, 88, July 18, 1942).

New Apparatus

Manufacture of cameras and accessories for civilian use had been curtailed greatly before the end of 1941, and was practically stopped during 1942. The purchase of precision miniature cameras and amateur motion picture equipment, remaining in dealers' stocks, required a high priority rating. Nevertheless, the war stimulated photography by the soldier and his family, with the result that interest was maintained, and business, especially that of the photo-finisher, was reported good.

Stull described a new 35 mm.

motion picture camera which had been designed especially for use under the difficult conditions of war combat duty. Features of this device, known as the Cunningham Combat Camera, were a large full-field finder, a quick-set four-lens turret, and a shoulder stock and notched handgrips, which permitted very rigid support of the camera during exposure (*Amer. Cinemat.*, **23**, 474, November, 1942) (Fig. 10). A description was also published of the "GSAP" gunsight 16 mm. motion picture camera, which was used both for training aerial gunners as well as making a record of their hits during actual combat. A special optical system gave a view, not only of the gunner's target, but also of the sighting apparatus used. An "overrun" device kept the camera operating a predetermined time after the pilot ceased firing (*Popular Phot.*, **11**, 32, September, 1942).

A useful paper was published by Kingslake, dealing with the development of lenses for aerial photography since the first ones were introduced about 1914. Special lenses designed in recent years include types for night photography by flash bomb, and survey lenses that cover a 35° or 45° half-field, and are completely distortionless (*J. Opt. Soc. Amer.*, **32**, 129, March, 1942). The characteristics of wide-angle airplane camera lenses were measured by Washer (*J. Research Nat. Bur. Standards*, **29**, 233, September, 1942).



Fig. 5. An American Sub's eye view of a sinking Japanese destroyer. First combat action photograph taken through the periscope of an American submarine. Destroyer sank in nine minutes after being hit by torpedoes launched by submarine. Note the two men in white scrambling over the conning tower at the right.

Credit: Official U.S. Navy Photography



Fig. 6. Remarkable table-top photograph showing the use of landing barges to establish a bridge-head. Barges, men and tanks made to scale. Note men moving up beach through barbed wire barricade. Imitation water was made mostly of cement, with surface painted in several colours and carefully illuminated. Individual pieces used to indicate bomb hits. Foamy wakes of boats made of a special material which is laid on the water surface.

Credit: Norman Bel Geddes and *Life Magazine*

An optical method for increasing depth of field of a motion picture camera lens was described by Goldsmith. The system was based on a division of the motion picture set into optically appropriate regions, each region having identifiable illumination. The identification and differential focusing were made at the camera of all regional images within a single exposure (*J. Soc. Mot. Pict. Eng.*, **38**, 3, January, 1942). Another scheme for increasing the depth of the field of a lens consisted of a method for oscillating the lens about 23,000 times per minute in a plane of 0.3 mm. depth on the lens axis. Working models were developed by the Bausch and Lomb Optical Company (*N.Y. Times*, **91**, 9, January 29, 1942). Data were published on three new Ektar anastigmats of the following focal lengths: 8½, 10 and 12 inches. Two Russian-made lenses for a miniature camera, known as the "FED," were described: one, a 100 mm. f/6.3, and the other, a 50 mm. f/3.5 anastigmat. The latter could be focused down to six inches by using a helical mount (*Miniature Camera Mag.*, **6**, 99, February, 1942).

A portable 16 mm. film developing machine for field service in the army was marketed by H. W. Houston, Hollywood, California (*Amer. Cinemat.*, **23**, 473, November, 1942). Future trends in motion picture laboratory practice were discussed by Wratten (*J. Brit. Kinemat. Soc.*, **5**,

10, January, 1942). Thompson described equipment problems facing the producer of 16 mm. sound films, and published the results of a survey as to future needs in this rapidly-expanding field (*J. Soc. Mot. Pict. Eng.*, **38**, 89, January, 1942). Several

developments in equipment used for special process work in the motion picture field were discussed by Henderson (*J. Soc. Mot. Pict. Eng.*, **39**, 245, October, 1942).

Krushchev told about the development of eight different 16 mm. motion picture projectors being manufactured in the U.S.S.R., under the third Five-Year Plan (*Kinofototekhnika*, **7**, 13, 1941).

Bornemann and Tuttle described an intensity-scale sensitometer which worked at the intensity-time levels used by the practical photographer (*J. Opt. Soc. Amer.*, **32**, 224, April, 1942). Sweet published details concerning a new photoelectric sensitometer which had a reading range of densities from 0.0 to 3.0 (*J. Soc. Mot. Pict. Eng.*, **38**, 148, February, 1942).

A useful photographic exposure computer, suitable for both ground and aerial photography, was designed by a sub-committee of the American Standards Association at the request of the U.S. Army and Navy. Readings are made from three tables, namely (1) the Light Index; (2) the Scene Index; and (3) the Film Exposure Index, and the sum of these values is set on a calculator dial, from which the proper aperture and exposure time can be read directly. Besides the military edition, a civilian edition was made available (*Phot. Trade News*, **6**, 9, July, 1942).

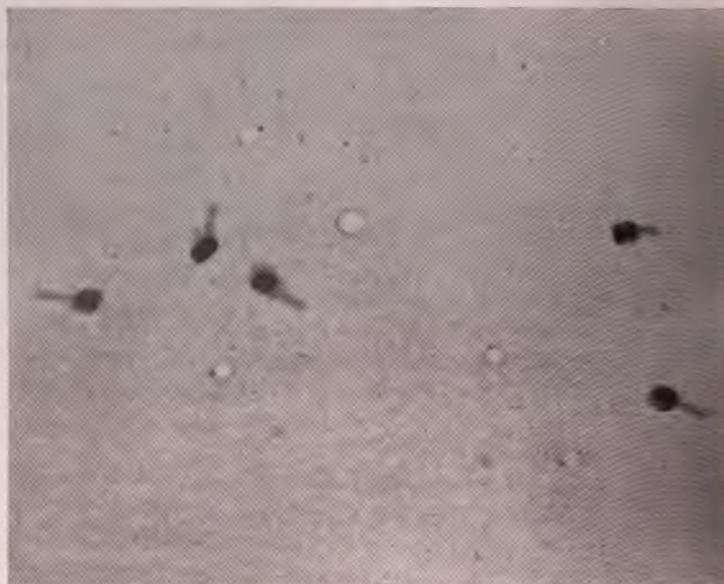


Fig. 7. Electron microgram of bacteriophage anti-coli P.C. One of the first pictures showing tail-like appendage on a bacterial virus, 40,000×

Credit: Photograph courtesy Drs. S. E. Luria and T. F. Anderson, Columbia University and R.C.A. Research Laboratories

An instrument known as the "Solubridge" was described by Schnoll, which it was claimed would be useful for the precise measurement of hypo concentration in wash water (*Phot. Trade News*, 6, 12, July, 1942).

The Photographic Process

Shortages of chemicals were not as serious in the United States and England as during the previous world war, although a few chemicals disappeared almost entirely from the market, as a result of the sources of supply being cut off by enemy action. Pyrogallol, for example, could not be imported except with great difficulty, since it was made from Chinese gall nuts. A shortage of hydroquinone in England was reported by Willcock, who discussed various methods of cutting down the quantity of this agent in developers, and otherwise economising its use (*Brit. J. Phot.*, 89, 192, May 22, 1942).

Evans, and co-workers, continued their interesting researches on methods of analysis of photographic developers. Papers were published on iodide analysis in a metol-hydroquinone developer and on synthetic aged developers by analysis (*J. Soc. Mot. Pict. Eng.*, 38, 180 and 188, February, 1942). In the latter paper it was pointed out that there are no unknowns in aged developers, the used solution differing from the original only in concentrations and in the presence of iodide as well as bromide. Potentiometric

methods were applied by Stott in connection with developer analysis (*J. Soc. Mot. Pict. Eng.*, 39, 37, July, 1942). Continuous replenishment and chemical control of motion picture developing solutions were described by Baumbach from a theoretical standpoint and as prac-

tised at the Paramount Laboratory on the west coast (*J. Soc. Mot. Pict. Eng.*, 39, 55, July, 1942).

Advances made during the past decade in methods and solutions used in photographic development were reviewed by Howell (*Amer. Annual of Phot.*, 56, 49, 1942).

The use of sodium hydrogen sulphate in acid hardening fixing baths was discussed by Woosley and Pankhurst, who also described a new melting point technique to determine hardening. The use of sodium acetate and boric acid in fixing baths containing potassium alum was considered essential by them to prevent sludge formation (*Phot. J.*, 82, 12, January, 1942). Crabtree, Muehler, and Russell described new stop and fixing bath formulas and dealt with the useful economic aspects of methods of revival of such baths (*Amer. Phot.*, 36, 28, April, 1942; abridged version in *Brit. J. Phot.*, 89, 239, 298, June 26 and August 7, 1942). Quantitative tests for residual hypo in photographic paper prints were published by Cary and Wheeler, which involved the application of one minim of a 400th normal iodine solution to five locations on the print (*Amer. Phot.*, 36, 16, February, 1942). Thorough washing of prints was considered very important, to avoid subsequent formation of sulphide spots. An instrument for measuring the turbidity produced by the Ross-Crabtree mercuric chloride test, for residual hypo in aerial negatives, was



Fig. 8. Automatic Developing Machine for V-mail prints. Enlargements of the letters to one-half the original size are made on photographic paper from 16 mm. film. The continuous roll of paper is developed on the automatic machine and separate letters are cut apart with an electric chopper. Credit: Photograph by U.S. Army Signal Corps

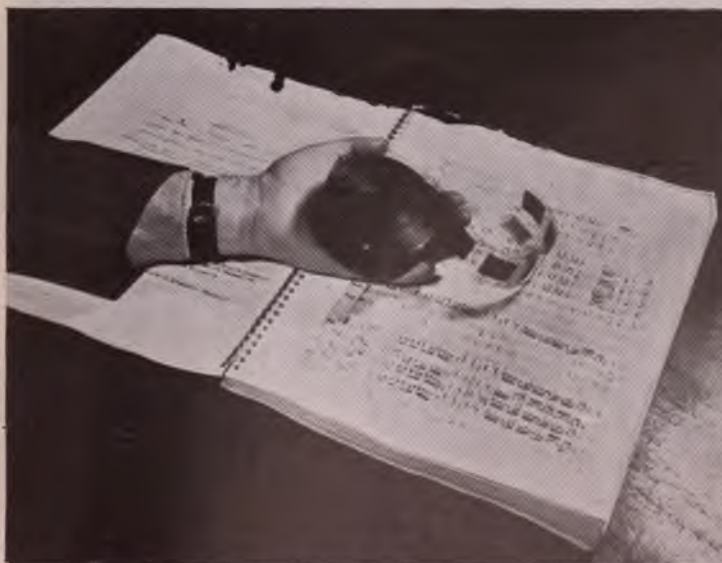


Fig. 9. Russian symphony on 100 feet of microfilm. The entire Seventh Symphony of Shostakovich is included on the roll of film held in the hand resting on the first of four books containing the complete symphony (252 pages).

Credit: Photograph by Eric Schall, *Life Magazine*

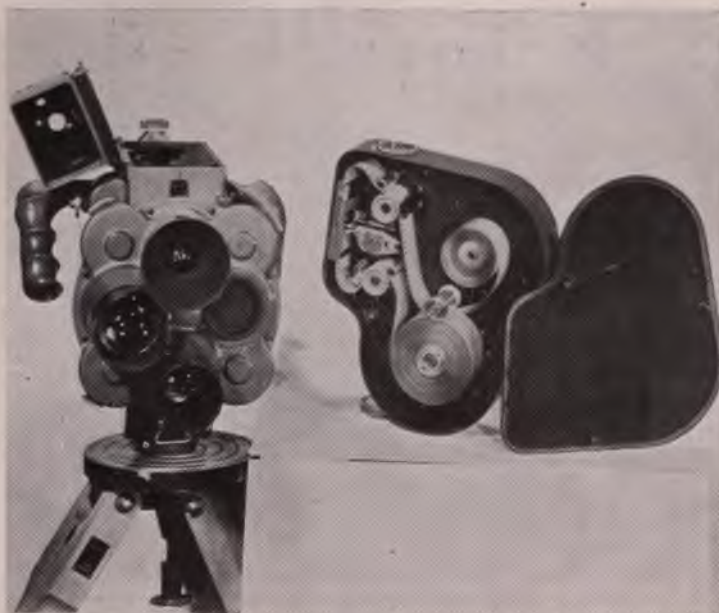


Fig. 10. Cunningham Combat Camera. Large view finder is swung back on a hinge to permit insertion of film magazine containing film gate and pull-down mechanism. Note hand grips on both sides of camera

Credit: Courtesy of Harry Cunningham, Hollywood, California

described by Evans (*Photogrammetric Eng.*, 8, 121, 1942).

Bibliography

Although the size of many of the photographic journals was restricted somewhat, as a result of paper shortages, the number of publications did not change appreciably. A merger of two well-established photo-

magazines, *Camera Craft* and *American Photography*, was announced in March. It was pointed out, however, that the Camera Craft Publishing Company would continue its business as a publisher and distributor of photographic books. The expansion of the Journal of the Photographic Society of America from a four- to a nine-issue per year

basis was welcomed by the readers of this official publication.

The more notable books of the year were:—

C. E. K. Mees, *The Theory of the Photographic Process*, Macmillan Co., New York. This monumental work represents a compilation of the more important investigations in photographic theory, that have been printed in several languages, and in a diversity of journals, during the last fifty years. It was written with the co-operation of a large number of specialists, who are members of the staff of the Kodak Research Laboratories, and, according to the preface, is intended "to provide a general handbook of the subject as a guide to the literature, and as a summary of its conclusions." The volume contains 1,124 pages.

L. W. Brownell, *Natural History with a Camera*, American Photographic Publishing Co., Boston; J. R. Roebuck and H. C. Staehle, *Photography, Its Science and Practice*, Appleton-Century Co., New York; C. W. Miller, *Principles of Photographic Reproduction*, Macmillan Co., New York; J. W. Bagley, *Aerophotography and Aerosurveying*, McGraw-Hill Book Co., New York; C. C. Scott, *Photographic Evidence*, Vernon Law Book Co., Kansas City; Y. I. Bokinek, *Theory and Practice of Colour Photography* (in Russian), Goskinoizdat; E. Stenger, *Die beginnende Photographie im Spiegel von Tageszeitungen und Tagesbüchern, 1839-1937*, Würzburg - Augmühle; C. F. Hoban, Jr., *Motion Pictures in the School*, American Council on Education, Washington.

A GUIDE TO RAW MATERIALS

In times of peace the industrialist is but little preoccupied with raw material supplies, merchants and producers vie with one another to offer him raw products from all parts of the world. To-day that condition no longer obtains, sources of supply have been cut off, transport is not available, demands have increased in some cases beyond belief, and so the whole question of raw material supplies has become more complex, more difficult and, of necessity, in many cases, controlled by Statutory Orders and Controls.

In the case of the really big consumers these matters are well known, but that is not so with the many users who only require small amounts, or

whose requirements do not call for constant supplies. For them this Guide is indispensable.

It lists over seven hundred articles of commerce used as raw materials in industry. In most cases it says what the material is, how and from whence it is obtained, and usually its more important uses. It tells whether or not there is any control, and, if so, to what extent; it also indicates whether licences are required for export or import, from whom or where such licences can be obtained, and any restrictions to which they are subject.

If there is a Control the materials covered are indicated, the Statutory Orders involved are listed and their

provisions summarised, and the address of the Control is given. Such a mass of information is of the highest possible value, and it is promised that monthly addenda will be published to notify changes in control and procedure. There is one other service the Ministry of Supply could offer, and that would be a guide to substitutes, for this is almost as dire a want to-day as the guide to raw materials. In the meantime, the Raw Materials Guide is here and welcome.

The Guide is obtainable from H.M. Stationery Office, York House, Kingsway, W.C.1, or through any bookseller, price one shilling.

H. W. GREENWOOD.



EDMUND A. ROBINS, F.L.S., HON. F.R.P.S.
Past President, The Royal Photographic Society

Photograph by J. C. A. Redhead, F.R.P.S.

Reproduced from a "Kodachrome" Transparency



SCOUT

Photograph by J. C. A. Redhead, F.R.P.S.

Reproduced from a "Kodachrome" Transparency



GETTING READY FOR "OFF"

Photograph by J. C. A. Redhead, F.R.P.S.

Reproduced from a "Kodachrome" Transparency



WOMEN AT WAR

Photograph by J. F. White

Reproduced from a "Kodachrome" Transparency

COMMENTS ON A YEAR'S COLOUR PHOTOGRAPHY

By D. McMaster, F.R.P.S.

This commentary on some of the progress of colour photography was given by the President of The Royal Photographic Society, at the joint meeting of the Society with the Manchester Amateur Photographic Society, on February 6th, 1943.

The meeting was held at the headquarters of the Manchester Amateur Photographic Society, 49, Lower Mosley Street: Mr. C. W. Bradley, F.R.P.S., was in the chair. It is our custom to publish in this issue annually a review of progress in colour photography during the preceding year, and Mr. McMaster's lecture admirably serves this purpose.

WHEN, a little over a year ago, you were good enough to invite me to talk before your Society, I took the opportunity of discussing some of the interesting and more unusual applications of colour photography. At that time I indicated to you that there were some new developments in hand and that several of them would be of immense interest to the photographic world. I promised that if I were invited to speak you again I would endeavour to place before you the work of one or two of the issues of our development and research work. So when your Secretary wrote to me last summer, I readily agreed to journey to Manchester and to cover some of the new products which have been developed on the market during the past year. Much of what I shall say to-day is already known to many of you, I hope that the repetition will not be boring and that it will be new.

It is a constant source of astonishment to me that the progress in colour photography should have remained so slow during a period when supplies have, perforce, been severely limited, and the opportunity for personal participation has been virtually nil. Never before in the history of photographic journalism has there been so much written on colour work as at the present time. Never have there been so many entertaining, instructive and provocative articles as are now appearing in the technical Press. It was possible for me to present in chart form the progress of human interest in the arts and sciences of photography during the past one hundred years, there would have been at varying intervals upward surges which we attribute to new thoughts on colour photography. The first important bump on the curve might well be dated the year 1861, when Clerk-Maxwell gave his now famous lecture before the Royal Institution audience on theory of colour vision. Thereafter the steadily rising curve would show a disturbance around 1869, when Louis-Jules du Haumont published his book, "Les Couleurs en Photographie." And so on the curve would run, showing surges of interest caused by Ives in 1890, John Joly in Dublin, in 1894, Lumière, with the Autochrome plates, in 1904, and Finlay a few years later. During the past thirty years amazing progress has been maintained, and the curve would, of necessity, show a series of bumps and rises almost continuous in nature. There have appeared recently as the first Kodachrome film with its technical name: Dufaycolor - still an excellent and trustworthy medium of artistic expression. Kodachrome, Agfachrome now the new Kodachrome.

It is not my intention to pass over the excellent work which has been done for so many years by those colour

photographers who have used colour sensitive emulsions linked up with suitable filters, and who built for their uses cameras which have exposed these emulsions by single or multiple exposure. Their work has been of the highest order, but my discussion this afternoon lies largely outside of this province. Similarly, I am not unmindful of the success which has attended the efforts of such workers in the cinematograph field as Gaspar, Kelly or Dr. Kahnus, with his superb Technicolor, to mention only a few. It will be evident to you, however, that we must not take time now to explore these specialised divisions.

The contributions to the literature on colour photography during the past year or so have covered an enormous field. We have had studies on the applications to advertising, on photography with polarised light, on colour photo micrography, medical photography, on the uses of colour in the studies of biology, botany, and zoology, and on geology, mineralogy and petrography. Even astronomy has not been neglected. There have been notations on colour photography of painting, art collections, etc., on the detection of faked stamps, on aerial photography. Although this field is naturally restricted, and on a wealth of scientific and industrial applications. In this last named province we have learned of the recording of the colour of soap bubbles, of the photography of the changing colour of thin oxide films on metal surfaces, colour printing of books, and a study of the optical properties of paint films. The internal film structure of film of nitro-cellulose, chlorinated rubber, resins and drying oils have all been studied, and such properties as tackiness, tensile strength, plasticity, elasticity, hardening, and optical characteristics have been determined.

In the Press field there has been discussion of articles, and of course the professional photographer, and the army of enthusiastic and unskilled amateurs, have been well treated. In view of the wealth of material available I hope it will not be considered my share of to mention one or two of the outstanding contributions. As I see them, with particular thought to the fact that they will be of use to the intelligent reader after information, and will be of practical value.

A distinguished contribution to the literature is that by Dr. D. E. MacAdams in his paper "Subtractive Colour Mixture and Colour Reproduction" presented in August, 1941, in *The Photographic Journal*. The paper gives an excellent background for the consideration of reproduction in any colour medium. As a practical contrast to the work of Mr. E. T. Baker published in the *Camera*, September,

1941, a paper on "Indirect Separations for Making Color Prints," in which he described the making of colour separation negatives for colour prints from colour transparencies. He discussed briefly colour printing in general, and then the use of a grey step wedge. He described a simple set-up for making contact negatives from the transparency, and suggested that the transparent grey wedge be used alone for trial exposures, using given exposure factors, in order to secure the correct exposure factors with minimum waste of film. More recently, in the *Journal of the Photographic Society of America*, Volume 8, Number 9, Mr. Charles H. Miller has contributed an article on "Color Prints from Kodachrome." Mr. Miller's story is simple and practical, and forms a most valuable supplement to the literature on the subject.

In *The Photographic Journal*, May, 1942, Mr. G. Scott Bushe discussed the meaning and effect of colour temperature, and this article is well worth your consideration. *The British Journal of Photography*, March 13th and 20th, 1942, issues, give a thorough review of recent commercial ventures in colour photography.

In the April, 1942, issue of *The Process Engraver's Monthly*, Mr. R. F. W. Selman discusses a new line of approach to an old problem in his paper "The Kodak Fluorescence Process of Colour Reproduction." Special water colour paints, containing a compound which fluoresces in ultra violet light, have been designed for use in the preparation of coloured original sketches for photo-mechanical reproduction. The amount of fluorescent material added to paints is related to the inks which are subsequently to be employed in printing in such a manner that colour correction is effected automatically during the exposure of the separation negatives. Exposure for blue and green filter negatives is to arc illumination, using hoods fitted with special compensating filters which transmit ultra violet, blue violet and green light; the black printer and red filter negatives are made with unscreened light falling on the copy. Continuous tone plates are recommended in order to keep down exposure times; an infra red plate should be used for the black printer negative. Sketches are prepared by using the special paints in the normal way, since the fluorescence is invisible in ordinary light. No supplies of apparatus or materials for this process are available in this country at present.

Of outstanding interest is the increased use of coloured photography in some of our more popular illustrated periodicals. In some instances ordinary litho methods have been employed, but in the case of one weekly, a modified Dultgen screen process is used. By this process photogravure printing surfaces are produced by etching through a resist prepared from registering half-tone and continuous-tone images, a carbon tissue forming part of the said resist being used to receive at least the continuous-tone image. The latter may be formed by making an ink print from a half tone original plate and making therefrom a photographic print having the image sufficiently blurred to obliterate the half tone formation. In one method the two images are printed in superimposition on positive material which is then used to print on a carbon tissue. In a modification, an ink print on a transparent surface is printed on to carbon tissue and also on to a soft working negative material, a positive from which is then printed in register on the carbon tissue. The original plate may also have the hollows filled with ink and an intaglio print taken therefrom, the resulting negative being printed on to positive material, which is used to print as above. The half-tone negative may also be printed on a resist layer, which is developed, and a carbon tissue printed from the continuous-tone negative superimposed thereon, or the two negatives may be printed on separate carbon

tissues, which are developed and superimposed. A single strength of acid may be used for the etching.

Printing by this process in colour is by four-colour rotary gravure—yellow, red, blue and black printing on high-speed, reel-fed presses from Kodachrome transparencies.

So much for a hurried and completely inadequate review of the published stories on colour photography. Just as hurriedly and, I am afraid, even more inadequately, I mention several of the developments of the year which have created widespread interest, and which are likely to leave a lasting impression. I shall speak of three: (1) The Kodak Masking Panchromatic Film; (2) Kodacolor film and paper; (3) the Kodatron lamp. Because it can be most simply explained and disposed of in this discussion, I mention the masking film first.

In making separation negatives from colour transparencies, use is made of a masking technique to control the contrast of any individual negative and thus improve the final colour rendering. In making duplicates from Kodachrome transparencies, it has been found that considerable control of the quality can be obtained by the use of a single mask. As with all such processes, problems of exactly registering the mask with the original, and keeping them in register, are of great practical importance and exact registration is made more difficult when conditions of temperature and humidity alter.

Largely to surmount these difficulties, Kodak masking panchromatic film was introduced. This is a dry stripping material on a temporary safety film base. The stripping layer bears a fine grain panchromatic emulsion, and by means of a special technique, involving the use of a simple hand-wringer, the stripping layer, with its emulsion, is removed from the temporary support, and transferred to the Kodachrome transparency, with panchromatic emulsion adhering to the Kodachrome image. An exposure is then made through the film base, using a printing light, the colour of which can be controlled by the use of a suitable Wratten filter (No. 25, a deep red, is recommended).

The Kodachrome film is now immersed in a suitable developer, when the panchromatic emulsion develops up to a contrast which can be controlled by altering the length of time of developer. After the normal fixing, washing, and drying have been completed, the Kodachrome transparency will now be masked so that it has an increased density in the highlights and in the coloured areas transparent to red (e.g., the red and yellow areas). There will be little or no density, however, added to the shadows or to the blue and green areas.

The effect of all this is to reduce the general contrast of the Kodachrome, and to introduce a colour correction resulting in an improvement of the final quality of the duplicate. Finally, the mask can be readily stripped from the Kodachrome original without causing any damage.

Perhaps to many of you here the most interesting development to be announced during the past year is that of Kodacolor negatives and Kodacolor prints. This announcement has been duly heralded in the lay press as well as in the various technical journals devoted to, or touching upon, photography. It will, perhaps, then only be necessary for me to remind you that the film is developed to a complementary negative, from which prints on paper can be made by the same process. The Kodacolor film is supplied in six roll film sizes, to wit, No. 127, No. 120, No. 620, No. 116, No. 616 and No. 122. It is processed by the manufacturer to a negative, and then the photographer can have prints made from the negative of his choice, and these prints are on a paper base. All the prints are made by projection, and are supplied always in the same width, irrespective of the

f the negative. The length depends upon the f the negative.

will bear with me, I am sure, if I project on to the few slides which serve to explain the very simple by which Kodacolor is made. First, let me that the product is available because of the fact plers in their emulsion layers are not dissolved elatin layer itself, but, to quote Dr. Mees, "are n very small particles of organic materials, which them from the gelatin and, at the same time, the silver bromide from any interaction with the . When development takes place, the oxidation of the developing agent dissolves in the organic l and there reacts with the couplers, so that the e formed in the small particles dispersed through rs."

inal item of interest to all photographers, as well rose particularly partial to colour work, is the on Speedlamp. Derived from work and experi- on performed by Professor Edgerton, of Massa- ; Institute of Technology, the Kodatron mp consists of a gaseous discharge lamp containing re of the rare gases, Krypton and Xenon. The e of the gaseous mixture is arranged so that its g potential is above the 2,000 volts to which the 12 mfd. condenser is charged through a trans- and rectifier.

scharge the condenser through the flash tube, a ltage pulse is sent through the gas mixture, which it and allows the charge from the condenser to e accompanied by a vivid light flash of short a. The high voltage pulse is controlled by a on trigger circuit.

irection of the flash and its brightness depend on acity of the condenser. For the full 112 mfd. er, the instantaneous candle power within the f the reflector is about fifty million, and the dura-

tion of the flash about one five-thousandth of a second.

If the condenser capacity is reduced to 7 mfd., the instantaneous candle power is reduced to about five million, and the duration of the flash to about one thirty-thousandth of a second.

The unit is operated from 50 cycle A.C. mains.

Already performing yeoman service in war industry, the Speedlamp has now turned its talented eye in the direction of colour photography, and already first-class results have been achieved.

And now, with your permission, I should like to present to you a wide variety of exhibits, which will indicate to you the possibilities of some of the materials now available for colour photography.

Colour Slides of Photoelectric Stress Analysis

The slide with a light background is the normal type of photograph obtained when investigating the stresses in a chair holding a railway line to a sleeper. The coloured lines show the distribution of the stresses, while their "order" represents the magnitudes of the stresses. High-order lines may be seen round the lower corners of the recess in the chair, and under the bolts holding the chair to the sleeper. The stresses between the chair, rail and the "key" or wedge are seen to be fairly irregular. The black areas in the head and foot of the rail show that these parts are not affected by the action of the wedge, since no stresses are present.

The slide with a dark background—taken with plane polarised light, instead of circularly-polarised—shows a set of black lines superimposed on the coloured pattern. At every point along these lines, the forces in the model are acting either vertically or horizontally. From this type of photograph the direction of the forces may thus be determined.

Mr. McMaster proceeded to exhibit a large number of examples of colour work.

EXHIBITIONS AT PRINCE'S GATE



"I believe I can climb"



"If I don't get giddy"



"The great thing is to hang on"

KITTY MAKES A CLIMB. By Bertram Hutchings, F.R.P.S.
Miniature Camera Group Members' Exhibition

SENSITISED METAL

By A. Batley, Ph.D., F.R.P.S., and F. W. Copplin, F.R.P.S.

THE sensitisation of metal is by no means new, even if consideration is restricted to sensitisation by silver salts. During the last two or three years, however, developments have taken place which have considerably broadened the possibilities of the establishment of silver halide sensitised metal in regular and large-scale use in certain technical fields. The main fields concerned are photo-mechanical (in a wide sense) and engineering, and consideration will be given to these developing applications.

SENSITISED FOILS AND PLATES

The use of sensitised papers or card is entirely satisfactory for ordinary photographic prints and records where dimensional accuracy is not of first importance. It is well known, however, that such materials alter in size during processing, due to swelling and shrinkage of the paper base, and that further dimensional changes occur after processing because of variations in relative humidity. For precision work, such as is required in the preparation of maps, certain engineering drawings, and in the making of scales and instrument dials, etc., such inaccuracies cannot be tolerated, and the need for a sensitised metal support to take the place of paper has been clearly shown. Accordingly, several types of both metal plate and thin foil are now being sensitised by Kodak Limited, for use in these fields. The metal is generally surfaced with a white pigmented layer before being emulsion coated, since this gives greater contrast in the finished print, though on certain metals, such as aluminium, sufficient contrast is obtained without the use of the white under-layer. Typical materials are "Kodak" Process White Foil, and "Kodak" Bromide White Foil, on which high and medium contrast emulsions, respectively, are used.

"Silvalith" Plates for Photo-Lithography

There have been several attempts in the past to increase the speed of photo-lithographic plates by substituting silver halide emulsion for dichromated albumen or gum, but until now no such plates have been produced in quantity or commercially. "Silvalith" plates, manufactured by Kodak Limited, consist of grained litho zinc coated with an unhardened process type emulsion. From the lithographic aspect they may be regarded as being similar to gum reversal plates, but their photographic speed is, of course, immensely greater, with the primary object of rendering them suitable for exposure by projection.

It is true that a few litho printers have installed projection apparatus equipped with high intensity arc illumination capable of producing properly exposed dichromated colloid plates by projection, but the exposures are lengthy and the apparatus must be very strongly constructed to eliminate the possible effects of vibration, and consequently it is expensive to build. A "Silvalith" plate can be treated during exposure as though it were a sheet of fast bromide paper, and requires much the same exposure time. In normal photo-lithography much of the work is printed by contact from negative or positive on to zinc coated with dichromated albumen or gum, and it is not suggested that "Silvalith" plates should replace these, although even here they offer some considerable advantages because of the constancy of speed of the plates, the fact that no whirler or other plate-coating equipment is needed, and that exposure may be made to a small

tungsten filament lamp, accompanied, if necessary, by simple voltage control, eliminating the more usual a lamp with its attendant variations in light intensity.

The real advantage offered by the "Silvalith" plate undoubtedly in projection or camera printing. The plate may be exposed directly in the camera or a projection enlarger, completely eliminating any intermediate negative or positive, and converted immediately into printing plate. As an example of the use of the plates in poster work, a 10in. by 8in. screen negative of 150-line ruling can be projected on to a number of "Silvalith" plates at an enlargement of, say, $\times 12$ linear, giving final printed poster of 10ft. by 8ft., with a screen ruling of 12 dots per inch. In step and repeat work, advantages can be seen in eliminating the normally necessary intermediate negative, and a further possible application in the future may be in the preparation of colour litho plate from a set of pulls taken from fine-etched and approved halftone blocks. Very little experience, however, is available at the present time in fine screen work on this plate and remarks apply mainly to line work or coarse screen.

In using the material, exposure to line positive copy, followed by development in a tanning developer, which causes the previously unhardened gelatin film to become



Fig. 1. Laminating transfer sensitising paper to lacquered metal



Fig. 2. Stripping the temporary paper support, leaving surface

wherever metallic silver is produced. No fixation is necessary, the plate being transferred directly from the developer to a bath of hot water, which removes the hardened gelatin, leaving a stencil of hardened gelatin against the background, while the "lines" of the drawing show as bare metal. After drying, the plate is as though it were a gum reversal plate by rubbing the surface with a bitumen washout solution, which adheres strongly to the bare metal. After again drying, the tin stencil is completely removed by means of hypochlorite or dilute sulphuric acid. The gelatin on the plate carries a line image in bitumen, and the background may then be made fatty acid repellent by "dipping" in the usual way with a gum arabic solution containing ammonium dihydrogen phosphate and sodium nitrate. After damping and rolling up with care, the plate is ready for the machine.

A positive copy can be reproduced directly by means of the reversal processing technique. After exposure, instead of developing in a tanning developer, a non-tanning developer is used, which develops the image of the stencil but does not harden the gelatin. A general exposure to white light is now given, which fogs the background, and this is followed by re-development in a tanning developer. This second development develops background areas but not the lines, since they were completely developed in the first bath, so that on the plate in hot water, the soluble gelatin containing the lines will be removed, leaving a negative stencil before.

When required, the plate may be conveniently "deep etched" at the stencil stage before the bitumen washout is applied, any of the normal deep etch formulae being satisfactory for this purpose.

INTRODUCTION OF PRECISION DRAWINGS AND TEMPLATES

The designer of such engineering projects as aircraft, car-bodies, etc., invariably prepares his first drawings to a much-reduced scale, which, if adequate to allow him to establish the principal detail of his design. More precise drawings, drawn to full scale, serve to establish the final design, the further stage of introducing these into production then requiring the preparation of stencils or templates, which are constructed from the drawings and are used in the workshops as guides, in the operation of cutting the metal to shape, in checking parts or making assemblies. On their surface may be marked all the details necessary for the manufacture of a part, for example, the position of bend-

lines, the angle of the bend, etc. For a single aircraft model, as many as twenty-five thousand of these metal sheets or templates may be required, and they govern directly the accurate dimensions of all the aircraft built. Further, several repetitions may be required, particularly in the case of aircraft production where several sets of patterns may be needed for use in a series of factories. In some circumstances, as, for example, where the number of finished machines required is limited, the preparation of templates and patterns may not be justified, and in this case, marking-out must be done on the actual metal or other material which is to be used in the fabrication of the aircraft part.

In any of these cases it is obvious that a method of photographically sensitising metal, plywood or other sheet material can aid the process of conversion from design to production stage. By photographic methods, a reproduction drawing or template may be prepared in a fraction of the time required by hand-scribing methods, with less skilled labour and with the added advantage that the possibility of errors is eliminated.

The precision with which patterns or templates must be made varies considerably from one type of engineering work to another, according to the nature of the project. Obviously, photographic methods cannot do more than reproduce proportionately the accuracy of the drawing. According to the requirements, the form of the original drawing may vary, and so also may the choice of the particular photographic method of reproduction. Usually the final reproduction is required to be to exactly the same scale as the drawing, but sometimes deliberate adjustment of the scale may be required.

Use of Transfer Sensitising Paper

The process essential to all variations on the photographic technique to be adopted is, of course, the operation of sensitisation of the metal, wood or other material. As the sheet materials involved are often of very large size, up to several feet in each dimension, the first requirement is that the process of sensitisation should be one which is easily applied on the user's own premises. It is equally essential that the sensitising layer must be well-bonded to the sheet, so as to be able to withstand the subsequent cutting and other operations without flaking away. It must be applicable to steel, aluminium, plywood or any other sheet material used, and should have a photographic speed which, while allowing convenient darkroom lighting, is suitable for projection as well as contact printing. In conformity with these requirements, a transfer method of sensitising has been worked out which is well-established in use in American aircraft and shipbuilding units, and which is now finding increasing use in this country. The "Kodak" transfer sensitising technique involves the use of a special form of dry-stripping paper which is laminated to the metal or other sheet material, and the temporary paper support then stripped off, leaving the sensitive emulsion layer on the metal surface. The metal or wood must first be lacquered, with the triple object of preventing chemical attack between it and the sensitising layer to be applied, of aiding lamination and of providing, if desired, a white background to the final image. The surface of "Kodak" Transfer Sensitising Paper has a thin lacquer supercoat applied in manufacture; this enables a very good bond to be made merely by applying a softener solution to the lacquered surface of the metal, followed immediately by rolling the transfer paper down on to it. The laminating apparatus need consist of nothing more elaborate than a flat bench-top or bed-plate and a rubber-covered steel roller, which is merely a heavier version of the ordinary photographic squeegee. Figs. 1 and 2 illustrate the operations of rolling down the transfer paper, followed by



Large-scale transfer sensitising machine (Handley-Page Ltd.)

stripping off the temporary paper support when the solvent softener has dried out and the sensitised metal is required for use. The same simplicity of apparatus is quite practical even with large work measuring several feet in either direction, but where a high rate of output of such large work is required, a more elaborate machine may be called for. Fig. 3 shows the laminating machine designed and constructed by Handley-Page Ltd., which firm was the first in this country to proceed with the installation of large-scale equipment for photographic reproduction of loft lay-outs. This machine is capable of dealing with sheets of metal up to eight feet by four feet, the operation of sensitising taking only a few minutes for each sheet. The sensitisation imparted is of the process emulsion type, so that the sensitised metal is then suitable either for contact or projection printing. "Kodak" Transfer Sensitising Paper is normally supplied in the form of rolls, which can be stored as readily as other commercial photographic materials. It can be applied to surfaces of any size, since the rolls of paper can be laid down in overlapping strips, as in laying wallpaper; on subsequent stripping a neat join is left in the sensitisation, which gives no important interference with the image.

The transfer sensitised metal may now be used in a variety of ways. For example, drawings on transparent or semi-transparent materials, such as tracing paper, linen, plastic sheet or glass plates, may be copied by ordinary contact printing in a vacuum pressure frame to give a negative image, which is usually quite suitable for use as a template. Such drawing materials as these are not acceptable for general use in the preparation of templates, however. Linen, paper, and, to a less extent, plastic sheet, are somewhat unstable in dimensions, and glass

plates are fragile. For these reasons, layouts are usually made on white lacquered metal or laminated wood. The conventional method of copying from materials necessitates the preparation of an intermediate glass negative, either by reflex copying, for which the "Kodak" Reflex Plate has been evolved, or by use of a camera of suitable precision. A further method dealing with opaque originals, namely, by "transfer," is referred to separately below, since it is distinct in principle from the conventional method. Reproduction by means of a reflex glass negative, frequently printed by contact on to the sensitised metal in a vacuum printing frame, gives reliable and correct accuracy of reproduction. A camera-negative can be made and projected back through the same camera system by which it was exposed, with a very high degree of accuracy, provided that the apparatus is properly designed and correctly used. Figs. 4 and 5 show the Handley-Page camera-projector unit, which is used in conjunction with the laminating machine already referred to. There are many interesting features of this unit which will not be described here, but the outstanding points are its rigidity and precision of adjustment and the manner in which routine use is facilitated by dividing the apparatus between two adjacent rooms, the lens being mounted in the wall between. The metal after exposure, is developed in a contrast develop-

"Reflex Transfer Method"

The above methods of use of "Kodak" Transfer Sensitising Paper all necessitate either a transparent original drawing or a film or glass negative transparency.

[Continued on p. 135]



Fig. 4. Camera unit for large work (Handley-Page Ltd.)



Fig. 5. Near view of camera, showing internal apparatus (Handley-Page Ltd.)

PHOTOGRAPHIC PROPERTIES OF MERCURY VAPOUR ELECTRIC DISCHARGE LAMPS

By H. K. Bourne, M.Sc., A.M.I.E.E., A.R.P.S., B.T.H. Research Laboratory

HF effectiveness of a light source for photographic illumination depends on the relation between the spectral distribution of the source and the colour sensitivity of the photographic emulsion used in conjunction with it. The light sources which have been employed in the past have been daylight, carbon arcs,

roduction low-pressure mercury vapour discharge lamps and tungsten filament lamps. Data previously been published on the relative photographic tiveness of these sources (1).

veral years ago the advantages of the earlier forms of -pressure mercury vapour lamps for photographic ications were pointed out (2). These lamps have been ibered frequently and are well known as illuminants treet and industrial lighting, for which purpose they primarily developed.

the latest forms of high-pressure mercury vapour is, greatly increased values of vapour pressure and age loading per unit arc length are employed, and a high value of brightness is obtained. In fact, values ightness in excess of those of high intensity carbon can be produced by such lamps (3). These lamps are ently suitable for projection. They emit radiation a high actinic value, and may be used advantage- y in the photographic field.

Another new lamp which has recently been introduced has a high efficiency but a low brightness. This lamp operates with a low pressure of mercury vapour in a tube coated with a fluorescent powder and gives a colour approximating to daylight (4). This lamp also should prove to be of considerable interest to the photographer.

Characteristics of Photographic Materials

The radiation from light sources is usually emitted over a wide range of wavelengths ranging from the ultra-violet through the visible region, into the infra-red region of the spectrum. In comparing light sources it is convenient to consider the spectrum to be divided up into a number of arbitrary wave bands. The limits of these wave bands, which are not very sharply defined, are shown, together with their characteristic properties, in Fig. 1.

The spectral sensitivity of photographic materials varies according to the type of emulsion, but in all the commonly used emulsions it is highest in the long wave ultra-violet and short wave visible regions of the spectrum. This may be seen from the curves in Fig. 2, which show the spectral sensitivity curves for some typical emulsions. The curves for the films are taken from *The Scientific Photographer* (5), while those for the papers and the spectral distribution curves for the lamps have been measured in this Laboratory.

Although the band of wavelengths which affects photographic emulsions has a lower limit below 3,000 Å, the glass used in photographic lenses absorbs radiation below 3,400 Å, so that this wavelength represents the lower practical limit. Since the panchromatic film does not respond to wavelengths above 7,200 Å, the band of wavelengths of most general interest in the photographic field lies between the limits of 3,400 and 7,200 Å, except in the case of infra-red film, in which the upper limit of sensitivity is extended.

The response of an emulsion illuminated by a certain light source usually depends considerably on the amount of energy from the light source contained in the region in which the film sensitivity is highest. Thus, light sources which radiate a considerable amount of energy in the long wave ultra-violet and short wave visible region of the spectrum are particularly effective for photographic illumination, since the peak of the sensitivity curve of the emulsion usually lies in this region.

Electric Discharge Lamps for Photographic Applications

The nature of the radiation from a high-pressure mercury vapour lamp is very different from that of the better-known light sources. This may be seen from the spectral distribution curves of various light sources which are shown in Fig. 3. The spectral distribution diagram of a typical high-pressure mercury vapour lamp measured in this Laboratory has been compared with the corresponding curves for a high-intensity carbon arc, noon sunlight and a tungsten filament lamp (1). The characteristic line spectrum of the mercury vapour lamp as compared with the continuous spectrum of the other light sources is quite apparent.

The spectral distribution curves for a water-cooled mercury vapour lamp and for a tungsten filament lamp are

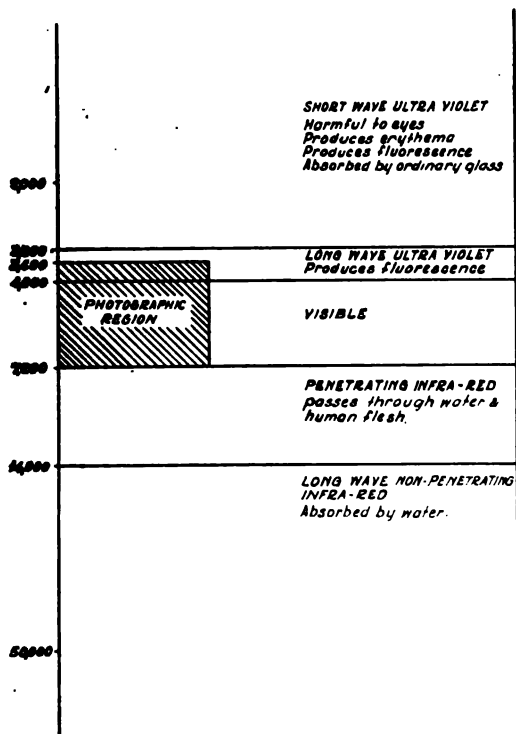


Fig. 1. Spectrum of radiant energy from light sources

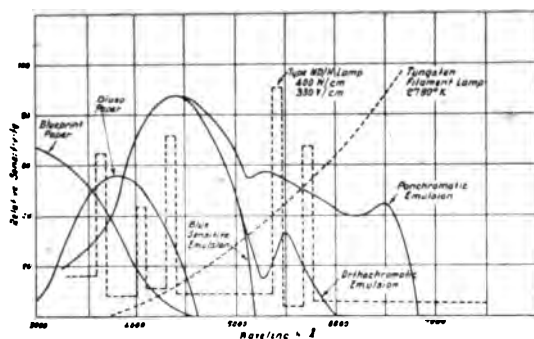


Fig. 2. Spectral sensitivity of photographic emulsions

also shown dotted in Fig. 2, and from this it may be seen that several strong lines in the spectrum of the mercury vapour lamp lie in the region in which photographic emulsions are most sensitive. This spectral distribution should be compared with that of the tungsten filament lamp which radiates most of its energy at fairly long wavelengths. Panchromatic film gives an increase in speed with tungsten filament lamps as the upper limit of this latter film is extended towards the longer wavelengths.

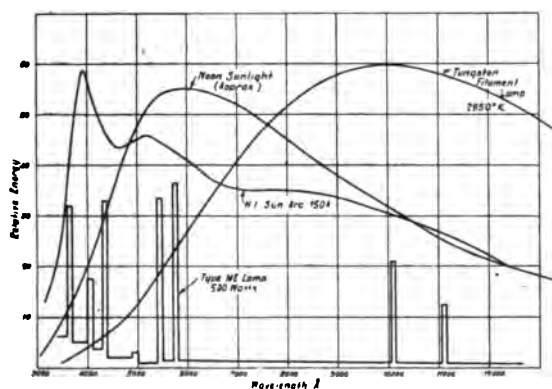


Fig. 3. Spectral energy distribution of light sources

Not only do the latest forms of mercury vapour lamps give a radiation of high actinic value, but also they have other properties which make them particularly suitable for photographic illuminants. Before discussing their applications, it will be well to describe briefly the general construction and leading characteristics of these lamps.

Type MD/H Water-cooled High-pressure Mercury Vapour Lamp

This lamp consists of a small quartz arc tube containing some mercury and two tungsten electrodes between which an arc operates. The value of the loading in the arc column in watts per cm. is very high, so that it is necessary to cool the lamp by a stream of water flowing rapidly over the quartz through a water jacket in which the arc tube is mounted. The inner lamp and the lamp complete in the water jacket are shown in Fig. 4, and the chief characteristics are given in Table I.

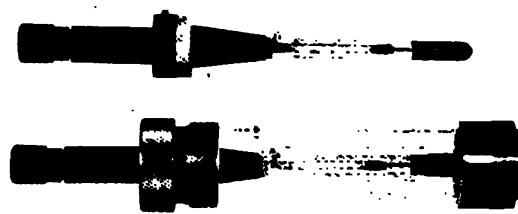


Fig. 4. Mazda type MD/H 1,000-watt water-cooled lamp

One feature of the water-cooled lamp, in which it differs from other forms of high-pressure mercury vapour lamps, is the very short run-up and re-striking time, as full light output is available within five seconds after switching on the lamp. The delay times are short owing to the small thermal content of the lamp, so that it will heat up and cool down rapidly. Another important feature of the water-cooled lamp is the small amount of heat radiation. Approximately 70 per cent of the radiation from this lamp is carried away in the cooling water, all the long wave infra-red radiation above 14,000 Å being absorbed in the water.

Water-cooled lamps require a high voltage for their operation, for example, a 1,000 watt lamp operates from a

Table I

CHARACTERISTICS OF 11 P.M.V. PROJECTOR LAMPS

Lamp type ...	ME	ME	ME	MD/H	MD/H
Lamp wattage, W. ...	250	250	500	500	1,000
Arc length, mm. ...	5	3	5	12.5	25
Arc width, approx. mm. ...	1.6	1.2	2	0.9	0.9
Supply ...	A.C.*	A.C.*	A.C.†	A.C.*	A.C.*
Supply voltage, V. ...	200/250	200/250	200/250	600	1,200
Lamp voltage drop, approx. V....	70	70	70	420	840
Lamp current, approx. A.	4.5	4.5	9	1.4	1.4
Initial max. brightness still, ...	10,000	20,000	20,000	30,000	30,000
Initial efficiency, l. W. ...	40-45	40-45	45-50	62.5	62.5
Life, hours ...	500	500	500	100	100
Operating position ...	Vertical	Vertical	Vertical	Horizontal	Horizontal
Method of cooling ...	Natural	Natural	Natural	Water-cooled	Water-cooled
Control gear ...	Choke	Choke	Choke	Transformer	Transformer
Run-up time, approx. ...	6 mins.	6 mins.	5 mins.	3-5 secs.	3-5 secs.

May also be operated on D.C.

1,200 volts obtained from a high-reactance. The cooling water may be supplied from town or the lamp may also be operated from a special cooling unit comprising a pump, fan and

Type ME Lamp

The form of lamp for projection is the air-cooled type, which is also known as the "compact" type by reason of its short and comparatively compact form. In this lamp natural air cooling is used, and an air stream of high brightness operates between two tungsten

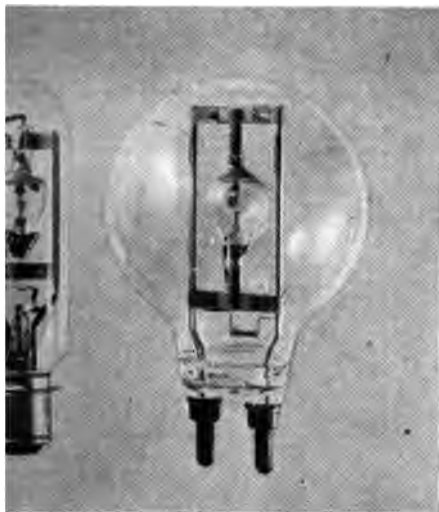


Fig. 5. 500-watt Mazda type ME air-cooled lamps

seals, sealed into a spherical quartz bulb, several inches apart. This lamp may be made in a wide range of wattages, but those which are available commercially are 250 and 500 watts. The 500-watt lamp, with its prefocused mounting is shown in Fig. 5. The 250-watt lamp is made in a rather unusual form of mounting, as the quartz bulb is mounted inside a metal box and the light is collected through a circular opening in one side of this box. When this lamp is used in photographic equipment it is sometimes possible to mount it in a lamp house, thus making it possible to use the apparatus in a very compact form. This lamp, known as the "Box" lamp, is shown in Fig. 6, and its characteristics are given in Table I.

These lamps operate from A.C. mains of 200 to 250 volts and a series choke. Operation from a D.C. supply is possible, but the overall efficiency will be reduced in proportion to the wattage lost in the series resistance.

Tubular Fluorescent Lamp

This lamp does not fall in the same category as the two previously described, as it is not a high brightness lamp, but it is of great interest to photographers. It consists of a straight glass tube five feet long, terminated at each end with a bayonet cap. The arc tube contains two electrodes and a quantity of mercury, and it is coated on its inner surface with fluorescent powder which converts the radiation of the mercury vapour discharge into visible light. Whilst various colours at high efficiency can be obtained by choosing suitable fluorescent powders, the 80-watt lamp is available commercially in a form which is very closely to daylight.

Characteristics of the Type MCF lamp are given in Table II. The chief features of the lamp are its low brightness, the long linear source shape, and the daylight colour rendering. The lamp operates from normal supply mains and for most practical purposes full-light output is available almost immediately after switching on, so that the lamp may be switched on and off as required.

Table II

CHARACTERISTICS OF TYPE MCF TUBULAR FLUORESCENT LAMP

Lamp wattage	80 watt
Length of source	5 feet
Diameter of source	1 1/4 inches
Supply	A.C.
Supply voltage	200/250 v.
Initial efficiency	35 l/w
Initial brightness (average)	0.5 stilb.
Lamp voltage drop	115 v.
Lamp current	0.8 A.
Life	2,000 hours
Control gear	Choke and starting switch

Characteristics of Mercury Vapour Lamps

In considering the use of the new light sources for photographic applications, the following characteristics are of importance:—

1. Actinic efficiency.
2. Amount of heat radiation.
3. Colour of the radiation.
4. Utilisation of the light source.

These various features of the new mercury vapour lamps will now be considered in turn.

Fig. 6. 250-watt Mazda box type ME lamp



Actinic Efficiency of Light Sources

Actinic tests have been carried out using the new mercury vapour light sources in order to determine the relative value of using these lamps for photographic applications. In carrying out these tests a number of light sources were compared, the characteristics of which are given in Table III.

Table III.—CHARACTERISTICS OF LIGHT SOURCES

1. TUNGSTEN FILAMENT LAMPS

Type of lamp	Wattage	Efficiency L. W.	Max. brightness stilb.	Life of lamp hrs.	Source Size mms.	Run-up time	Auxiliary apparatus
Coiled-coil, gas-filled ...	100	12	500 to 1000	1000	Pearl bulb	Instantaneous	None
Class A1 Projector	300	20	1700	100	9.5 7	Instantaneous	Resistance or transformer for low - voltage lamps
Photoflood ...	275	34		2	Pearl bulb	Instantaneous	None

2. HIGH-PRESSURE MERCURY VAPOUR LAMPS

Type MA. Natural cooling. Glass inner and outer tube ...	400	45	150	1500	160 × 7	4-5 mins.	Choke
Type MB. Natural cooling. Quartz arc tube. Glass outer bulb ...	125	40	1000	1500	30 × 2	3 mins.	Choke
Type ME Box. Natural cooling. Quartz arc chamber. Thick glass outer ...	250 250	45 45	10000 20000	500 500	5 × 1.6 3 × 1.2	6 mins. 6 mins.	Choke Choke
Type ME. Natural cooling. Quartz arc chamber. Glass outer bulb	500	50	20000	500	5 × 2	5 mins.	Choke
Type MD/H. Water - cooled. Quartz arc tube. Glass outer jacket...	500 1000	62.5 62.5	30000 30000	100 100	12.5 25 × 0.9	3-5 secs. 3-5 secs.	High reactance high voltage transformer. Water supply from mains or cooling unit

3. LOW-PRESSURE MERCURY VAPOUR LAMP

Type MCF. Natural cooling. Glass envelope	80	35	0.5	200	5ft. long 1½ in. diam.	— —	Choke and start- ing switch
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Only a few types of typical photographic emulsions have so far been tested, but sufficient work has been done to establish the great value of these lamps for photographic purposes. Kodak Plus X, Super XX, Background X, and Selochrome films were used as representative negative materials. In addition, Kodak and Ilford positive film was tested, and Kodak, Ilford and Granville bromide and gaslight papers.

A magnesium oxide screen, on which was mounted a B.T.H. Type PV.921 photo-voltaic cell, was illuminated with the various light sources. The calibration of the photo cell had been obtained previously with the light sources which were used in the tests. A photograph of the screen

was taken at a series of different levels of illumination, with the various light sources. For each test the whole series of photographs was taken on one length of 35 mm. film, so that the conditions of development were the same for all the tests.

After development of the films the density of each negative was measured and the value was plotted against the illumination. The amount of illumination required to produce a given density was determined in each case, so that the relative speeds of the films with the different light sources were compared for equal values of illumination.

The papers were exposed to the light sources at various levels of illumination through a step wedge. The illumina-

Table IV
RELATIVE SPEED FOR SAME VISUAL ILLUMINATION

Photographic material	Coiled coil tungsten filament lamp 100W. 230V.	275W. Photoflood lamp	Class A1 tungsten filament projector lamp 300W. 100V.	80W. Type MCF fluorescent lamp	125W. Type MB lamp	250W. Type ME box lamp	1000W. Type MD/H water-cooled lamp
Panchromatic film	1	1.2	1.1	1.2	1.2	1.2	1.3
Orthochromatic film	1	1.4	1.3	2.5	3.3	2.2	3.6
Positive film	1	2	1.6	—	6.4	7	5.6
Bromide paper	1	—	1.2	—	7.8	8.3	6.6
Gaslight paper	1	—	2	—	9.3	7	12.3

Table V
RELATIVE SPEED FOR EQUAL POWER CONSUMPTION

Photographic material	Coiled coil tungsten filament lamp 100W. 230V.	275W. Photoflood lamp	Class A1 Photoflood filament projector lamp 300W. 100V.	80W. Type MCF fluorescent lamp	125W. Type MB lamp	250W. Type ME box lamp	1000W. Type MD/H water-cooled lamp
Panchromatic film	1	3.4	1.8	3.1	3.5	4	6
Orthochromatic film	1	4	2.2	6.5	9.7	7.3	16.4
Positive film	1	5.7	2.7	—	19	23	25.5
Bromide paper	1	—	2.0	—	23	27.4	30
Gaslight paper	1	—	3.3	—	27.5	23	56

tion required to produce a wedge of a certain density in the different cases was compared by visual observation.

The results of the tests are given in Table IV, which shows the relative speeds of the various photographic materials when exposed to the different light sources for equal values of illumination, and in Table V, which shows the relative speed on a basis of equal power consumption from the mains. An allowance was made for the power loss in the control gear used with the discharge lamp. The results show that the effective speed for the various emulsions is increased considerably by the use of mercury vapour lamps for illumination. For example, using orthochromatic film and a water-cooled mercury vapour lamp, for equal illumination the exposure required is only one-third of that required if a coiled coil tungsten filament lamp was used. For equal power output from the mains, the necessary exposure is reduced in the ratio of 1:16 due to the high efficiency of the mercury vapour lamp, while the heating effect on the subject is reduced very considerably. The difference in the case of panchromatic film is not so marked on a basis of equal illumination although a gain is realised due to the high luminous efficiency of the mercury vapour lamp when a basis of equal wattage is taken. This result is to be expected, due to the higher sensitivity of panchromatic film in the red region of the spectrum.

The higher speed of the mercury vapour lamps with the former types of emulsion is, of course, due to the higher output of these lamps in the blue region of the spectrum as compared with tungsten filament lamps. The increased actinic value of the tungsten filament lamp operating at a higher temperature is also shown in Table IV by the figures given for the Class A1 projector lamp and the photoflood lamp, both of which operate at a higher temperature than the coiled-coil gas-filled lamp. Increase of operating temperature in a tungsten filament lamp leads to a reduced life.

It should also be noted that there are considerable variations in photographic materials from different sources, and that those tested are only representative types of materials. The figures given in these tables should serve as a guide to the results to be expected from various photographic materials and should not be taken as absolute values.

Heat Radiation

Measurements of the total radiation of various light sources have been made in this Laboratory. The high luminous efficiency and the low value of total radiation per lumen output of the mercury vapour lamps is evident from the diagram in Fig. 7.

A number of practical tests have been carried out in which the Type MD H and ME lamps have been compared with a tungsten filament projector lamp. Measurements of the temperature rise on the human skin exposed to the light from the same projector using each of these lamps, are shown in Fig. 8. These tests show that for the same temperature rise on the skin, an illumination of 4.2 and 4.7 times that of the tungsten lamp may be used with the Type ME and MD H lamp respectively. The advantage of using such sources in film studios is obvious.

Measurements have also been carried out on a lantern slide projector. In this case a 300 watt tungsten filament projector lamp, a 250 watt Type ME and a 500-watt Type MD H lamp were used as the light source, and the illumination on the screen in the three cases was in the ratio of 1 to 1.9 to 3.25, while the temperature rise on the lantern slide was 124 C., 52 C. and 42 C., respectively. The large gain in illumination and reduction in heating on the lantern slides show that the high-pressure mercury vapour lamps are well suited for this purpose.

Another interesting comparison shows that a 1,000-watt tungsten filament lamp radiates about 700 watts of infra-

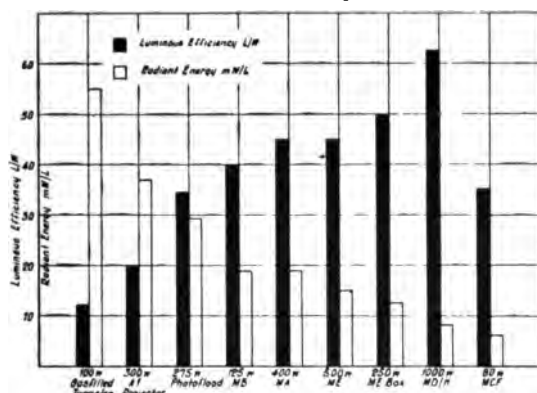


Fig. 7. Radiation and efficiency of light sources

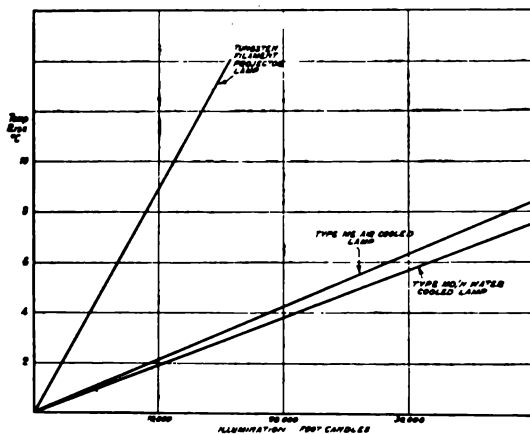


Fig. 8. Temperature rise on skin when illuminated with various light sources

red energy, while a water-cooled Type MD/H lamp of the same wattage gives nearly three times the light output with less than half the total wattage radiated.

Colour Rendering of Light Sources

When a coloured scene is photographed in monochrome, the various colours are reproduced as different shades, ranging from white to black. If the appearance of objects as seen in daylight is assumed to be their normal appearance, we will show how different light sources render the various colours as compared with the rendering produced by daylight illumination. In order to do this an Ilford colour chart was photographed with various illuminants using a panchromatic film. When this colour chart is photographed under daylight with a filter to give full correction for the film used, the densities on each side of the chart are equal. When these densities do not match, this signifies a deviation from daylight colour rendering.

The colour chart has been photographed under illumination from tungsten filament lamps, various high-pressure mercury vapour lamps and Type MCF fluorescent lamps. Paper shortage has made it impossible to reproduce these photographs in the pages of this *Journal*. However, an examination of the photographs shows that with tungsten filament lighting, red colours appear too light, due to over exposure on account of the excess of red light from this lamp, while blue colours are under exposed and so too dark.

With low- and medium-pressure mercury vapour lamps the reverse is the case, red colours appearing too dark. Lamps with a higher pressure of mercury vapour, e.g., the water-cooled lamp, give a better balance due to the increased output of red and continuous radiation. The Type MCF fluorescent lamp gives excellent colour rendering and all regions of the spectrum are reproduced in the same tones of monochrome as they would be with daylight illumination. Practical tests confirm the conclusions reached by a study of the colour chart.

While the real value of true colour rendering into monochrome by the light source is important in many cases, this is not always the case in portrait work. Portrait photographers do not always require to produce the true translation of the colours into their correct relative shades of black and white, but instead they wish to produce a pleasing effect which is not necessarily the same as that produced by true colour rendering.

Utilisation of Light Sources

The various lamps have widely differing efficiencies, brightness, and source size, and these factors, in addition to their actinic values and colour rendering, determine their effectiveness and applications. The electrical and optical characteristics should thus be examined in conjunction with the relative photographic speeds for a given illumination in order to assess the real value of these light sources. These characteristics of the lamps are summarised in Table III. The results in Table V, giving relative speeds of light sources for the same power consumption from the mains, should be regarded as approximate only, as in some applications it may not be possible to use a highly efficient light source so effectively as one of lower efficiency due to an unsuitable source shape, unless a special optical system is designed, so that in this case the gain would not be proportional to the luminous efficiency. It is, nevertheless, clear, from an examination of this table, that a considerable reduction in power consumption or increase in speed may be achieved by using mercury vapour discharge lamps in place of tungsten filament lamps.

Another point in the utilisation of the new light sources is the fact that variation in mains voltage produces less change in light output and lamp life than in the case of tungsten filament lamps. The effect on light output may be seen in the curves in Fig. 9.

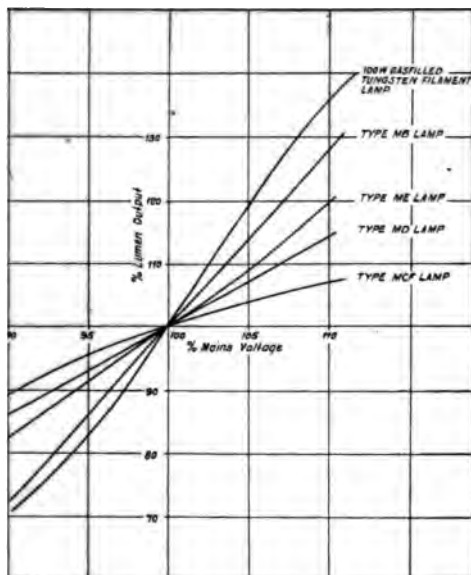
It is well known that there is a cyclic variation in light intensity from discharge lamps operating from an A.C. supply. For example, with a supply at 50 cycles per second, the light output from a Type MD/H lamp varies 100 times per second between a maximum of 100 per cent and a minimum of 4 per cent. This variation may produce a stroboscopic effect on moving objects, but it may be easily overcome if desired by operating banks of three lamps, one on each phase of a three-phase supply, or by using either a high frequency or D.C. supply.

Applications of Discharge Lamps for Photography

As a result of the tests described, together with other practical tests which have been carried out, and a consideration of the characteristics of the lamps, it is clear that the new types of mercury vapour discharge lamps should have numerous applications in the photographic field. Various uses for these lamps will be discussed in greater detail below.

1. Film Printing

For the same visual illumination, the mercury vapour lamp gives an increase in printing speed with positive film of about four times that given by the Class A1 tungsten filament projector lamp, which is commonly used in film printing machines. The Type MD/H or ME



9. Variation of light output with change of mains voltage

re the most suitable for this application, and by these in place of the tungsten filament lamp, the machines may be operated at a higher speed consequent increase in the rate of film production increase in heating in the printing machine. The output from the mercury vapour lamp may be used at a constant value more readily than in the tungsten filament lamp. This is due to the smaller variation in light output caused by mains voltage fluctuations and the good lumen maintenance throughout life of the mercury vapour lamps. A special form of assured mercury vapour lamp may also be used as a source of radiation for certain ultra-violet photographic processes.

to Copying and Engraving

For copying and allied processes, the Type MD H or F lamps will give an increase in speed, particularly used with the orthochromatic emulsions which are easily employed. A high level of illumination may be provided on the copy board with these lamps with uniform light distribution and with very little heat.

The Type MCF lamp, when used for this purpose, has the additional advantage that owing to the long diffuse light source, trouble due to specular reflection from shiny surfaces is eliminated.

Studio Lighting

In the production of films a very high intensity of light is required on the set, and this is usually obtained from tungsten filament projector lamps or arcs mounted in spot lights. Difficulty is often caused due to the heat radiation from these lamps, especially when a large bank of high-powered lamps is used. The use of Type MD H or Type ME lamps for illumination will enable high levels of illumination to be obtained without excessive heating while the higher value of these sources is an additional advantage. These lamps should be used in conjunction with some tungsten filament lamps to give the necessary colour balance, as the colour rendering produced by the mercury lamps alone is not sufficiently good.

For general lighting in studios the Type MCF lamps will be very suitable, as banks of these may be used to give a high intensity of light of good colour.

4. Television Studio Lighting

Similar considerations to the above apply to the lighting of television studios. Water-cooled lamps have been used with success for this purpose (7), and it is claimed that a further advantage is realised in this case due to the fact that the spectral radiation of this lamp matches the spectral sensitivity of the iconoscope television camera. In both film and television studio lighting it is advisable to take precautions already mentioned to prevent stroboscopic effect.

5. Photographic Studio

The Type MCF lamp should be a valuable light source for use in the photographic studio. The colour rendering is excellent and these lamps are particularly suitable for giving a uniform soft light which may be supplemented by filament spotlights where required, to produce suitable modelling.

6. Projection Microscopes

Previously the light sources used in projection microscopes were the carbon arc and the Pointolite lamp. The 250-watt Type ME box lamp is well suited for use for photographic work with projection microscopes. The constancy of the light output is a desirable feature while the increase in illumination and the high actinic value give a reduction in the time of exposure. The latter features are particularly advantageous at high levels of magnification, as under these conditions the provision of adequate illumination had previously been a difficult problem. For visual examination at high magnifications this light source gives better resolution owing to its line spectrum. The use of the 250-watt box lamp also enables the design of the instrument to be made more compact.

7. Profile Projectors

Another form of instrument in which the Type ME lamp is particularly successful is the profile projector. Here the small light source may be used to advantage to produce a very sharp shadow of the profile of the object to be examined. The resulting projected image on the screen will be not only very much brighter, but will also have sharper definition than that produced by a tungsten filament lamp. An improved photographic record of the image will thus be obtained.

8. Commercial Enlarging and Printing

In commercial enlarging and printing, maximum speed is of great importance. The earlier forms of high-pressure mercury vapour lamps have been employed in the past with considerable success, but the recent Types MD H and ME lamps are now being used successfully for this application. In cases where a high degree of enlargement is required, an intense source of light which will not overheat the negative is necessary. The Type MD H lamp appears to offer a good solution to this problem. The gain in illumination and actinic efficiency from the discharge lamp has made it possible for some purposes to employ cheaper photographic material which was formerly too insensitive.

9. Oscillographs

The Type ME or MD H lamps are useful sources for an oscillograph. The high actinic value of these sources enables bromide paper to be used instead of film (8), thus giving a reduction in cost, and facilitating handling. If the lamp is operated at a high frequency, for example, at 500 c.p.s., the trace is in the form of a series of dots, each

1,1,000 seconds apart, so that no timing wave on the oscillograph is necessary, as intervals of time may be read off directly by counting the number of dots in the trace.

10. Blue Printing

The enclosed carbon arc has been widely used for blue printing and has been quite satisfactory. This source is rich in the short wave radiation required for the process, but suffers from the disadvantage of requiring frequent servicing and replacement of carbons. The Type MA high-pressure mercury vapour lamp giving a high output of the 3,650 Å line has been used successfully in place of the carbon arc. It is as effective as the carbon arc for equal power consumption from the mains and has the advantages of steady burning and of requiring very little attention.

The Type MD II and ME lamps may enable a more compact form of blue printing machine to be designed.

11. Film and Slide Projection

The new high-pressure mercury vapour lamps may be used successfully for the projection of monochrome lantern slides and films. A considerable gain in screen illumination and reduction in heating on the slide or film is obtained.

The appearance of monochrome films is particularly pleasing with a high-pressure mercury vapour lamp as the projection source, but the projection of coloured films is not altogether satisfactory, due to the fact that the films are processed for projection with the high intensity carbon arc.

12. Flash Photography

The high-pressure mercury vapour lamp may be overloaded considerably for a very short time so that a bright flash of light is produced which may be used for photographic purposes. For example, the 400-watt Type MA lamp may be operated at twenty times its normal wattage for a time of ten to one hundred milliseconds. While operating at its normal wattage, the light output is adequate to enable the photographer to arrange the subject and to focus the camera. The lamp gives a total light output of 35,000 lumen seconds with a 1/10 second flash. Two common sizes of aluminium foil flash bulb have a total light output of 24,600 and 53,000 lumen

seconds respectively, with a duration of flash of forty milliseconds. The mercury vapour lamp may be flashed repeatedly while the ordinary form of flash bulb must be discarded after one flash. The duration of the flash and its intensity may also be varied by altering the constants of the electrical circuit. Such a lamp may be used to advantage in certain scientific applications of flash photography.

Conclusions

The discussion in this paper shows that the new forms of high-pressure mercury vapour lamps, by reason of their high efficiency and actinic value, and small amount of heat radiation, should prove to be useful sources in the field of photography. In photographic and film studios, a considerable increase of illumination with reduction in heat is possible, and in many photographic processes a large increase in speed or reduction in power consumption is obtained by their use. Enlargements to a high degree of magnification with low negative temperatures are also rendered possible. The lamps may also be used to advantage as light sources for the projection of films and slides. A few of the more important applications are described in this paper, while other applications of these lamps will be apparent to the photographer.

The author wishes to thank his colleagues in the Research Laboratory who have assisted him in the work described in this paper. Special thanks are due to Mr. H. R. Ruff for his measurements on the spectral distribution of light sources. The author is also indebted to Mr. H. Warren, Director of Research, B.T.H. Co., for his permission to publish this paper.

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SENSITISED METAL (continued from page 134)

from it. A further method of use of the same Transfer Paper allows reproductions to be made direct from an opaque original (for example, drawings on metal or wood), without the preparation of an intermediate negative or any camera equipment. This depends on the use of the Transfer Sensitising Paper as a reflex copying material, transfer to the final lacquered support being made after exposure but before processing. The sheet of paper is first exposed in contact with the original drawing as in ordinary methods of reflex copying using light with a special yellow screen, is then laminated to the lacquered metal plate as before, allowed to dry out, the temporary paper support stripped away and the metal sheet carrying the exposed sensitive layer then processed. The possibility of slight alteration in dimensions of the paper between exposure and transfer, due to atmospheric humidity effects is minimised by carrying out the two operations in fairly rapid succession, and preferably in the same room. The dimensional accuracy of reproduction is then of the order of 0.003 inch per foot or better.

The final copy is in the form of a negative, but is not laterally reversed.

By comparison with the photo-copying methods already well established in engineering drawing offices as a means of preparing file negatives and photographic equivalents of linen tracings, the photographic techniques which have been referred to are a relatively new development. It is obvious, however, that the two fields can very appropriately be linked together, in that some of the intermediate steps required may be common to both. Together they represent a very important example of the important part which photography can play in industry.

In conclusion, thanks are due to Handley-Page Ltd. for kind permission to use the illustrations of their plant.

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RESEARCH LABORATORY,
22nd March 1943.

PHOTO-ENGRAVING IN 1942

By H. M. Cartwright, F.R.P.S.

The complete story of progress in 1942 cannot be written until after the war, for there can be but that much work having a bearing on photo-engraving is going on, for various reasons, but published at the present time.

One effect of war-time conditions has been to inspire a search for substitutes for many materials and materials, while the use of valuable silver and other metals has received much attention. A general problem of residues is mentioned by H. Gernsheim (*Process Engraver's Monthly*, 49, April, 1942, 1 May, 1942, 116), who has described some remarkable figures on chemicals, and describes methods in use for recovering including the well-known "process of sulphur," electrolytic and other processes. A method in which a hydrophilic colloid, containing metal above silver in the motive series, is the subject of 2,214,765.

The use of a vignetté screen in place of the usual cross-line screen is, at present, receiving attention in many quarters.

One practical outcome, unfortunately, is not available for commercial use in this country. The Kodagraph contact screen described by F. W. Coppin in the *Engraver's Monthly*, 49, 1942, 86. It has a grainless surface, and is of a magenta colour. It is used with a continuous negative of similar colour for a screen positive on film or where contrast can be controlled by use of light of a suitable colour.

For many years attempts have been made to prepare large litho plates for similar work by direct action on to metal. When this is done with a suitable condenser special form of arc lamp, to project a large image on litho plates coated with bichromated emulsion, much difficulty was experienced owing to the prolonged exposure required. In response to a request from a Government department experiments were carried out on a method of photographing on litho plates coated with a photo-emulsion in the preparation of a printing surface. One difficulty was to avoid chemical reaction between the metal and the silver emulsion. This had already been accomplished in the case of aluminium by the use of anodised

metal, but this technique had certain drawbacks, in addition to the war-time restriction on aluminium.

The problem was solved, in the first instance, by the use of a substratum to separate the emulsion from the metal (Cartwright, Haigh and Smith, B.P. 545,942, 23.12.40). A line or half-tone subject is photographed on the coated plate by contact or projection. The plate is developed in a tanning developer to selectively harden the gelatin, the soluble portions of which are washed away with hot water. The substratum is removed from the image portions in the process of converting the plate to form a lithographic or "offset-deep" printing surface. Modifications of the process allow of the production of a plate etched in relief or intaglio, or of a reversal of the image. Later, the same patentees developed a process (B.P. 548,716, 13.6.41) in which the reaction between the metal (zinc or its alloys) and the emulsion was prevented by chemical treatment of the plate before coating.

Meanwhile, the Printing and Allied Trades Research Association, in collaboration with members of the staff of Kodak, Ltd., in their patent No. 547,795, I.I.41, have referred to the use of a protective layer of metallic silver to avoid reaction with the photographic emulsion. It is interesting to note that the use of a silver substratum for the above purpose has been previously mentioned by Schumacher (*Penrose Annual*, 17, 1911, 190).

The above processes were intended to satisfy a war-time need, but will, in time, become available for commercial use, and, no doubt, will play an important part in the production of posters and similar work after the war.

There is little new to report about colour reproduction, though the Kodak fluorescence process (described by F. W. Selman in the *Process Engraver's Monthly*, 49, April, 1942, 87) would seem to have interesting possibilities. It is an attempt to obtain "automatic" colour reproduction, and its application is limited to work from originals prepared with special paints. A material is included in the paints which fluoresces in ultra-violet light, the amount of it in the paints being related to the characteristics of the printing inks. The light falling on

the original from arc lamps is screened by suitable filters, and it is claimed that the resulting colour-separation negatives can be used without colour correction.

A further aid to systematic screen-negative making is a special form of circular slide rule for calculating the stops, screen distance, exposure, etc., for different types of original under various conditions of lighting. It is the invention of J. Warne (Prov. Pat. No. 187, 9.2.42).

The problem of avoiding moiré pattern in copying half-tones has been tackled in a novel manner by F. H. Smith (*Process Engraver's Monthly*, 49, February, 1942, 48), who has supported his theory with some striking illustrations of results obtained in practice.

It is interesting to note that the *Process Engraver's Monthly*, the leading photo-engraving journal in this country, completed its forty-ninth year of publication in 1942. It was founded by H. Snowden Ward, under the title of *The Process Photogram*. He was succeeded by T. C. Eamer, who remained at the helm for twenty-five years. A. E. Dent, the present editor, is to be congratulated on building so successfully on the foundations laid by his predecessors.

"P.E.M." JUBILEE

In its January issue *The Process Engraver's Monthly*, which celebrates its jubilee this year, it having been founded in 1894 as *The Process Photogram*, printed many messages of congratulation from leaders and others associated with the industry, including Lord Iliffe, Lord Southwood, Mr. C. W. Bowerman, P.C., Dr. A. J. Bull, Mr. T. C. Eamer, Mr. R. B. Fishenden, Mr. Charles W. Gamble, Mr. F. J. Mortimer, C.B.E., and Mr. Hannen Swaffer.

Some of the writers of these congratulatory messages recall reminiscences of the origin of "P.E.M." and its first editor, the late Mr. Henry Snowden Ward, a famous figure in the photographic circles of those days. Dr. Bull contributes a particularly interesting recollection:

"One of my earliest memories in connection with photo-engraving is that of a cavalier figure in a cowboy hat strolling down Fleet Street: it was Henry Snowden Ward, the editor of *The Process Photogram*, a journal to which I first contributed in 1895. In that period of rapid development the journal was of immense value to our craft. Later it became the "P.E.M." which is recognised as the leading journal dealing with the photographic production of printing plates. Under its present able editor it will, I am sure, carry its fine tradition into the future."

We unite our hearty congratulations with those of all the many friends of *The Process Engraver's Monthly* and its editor, Mr. A. E. Dent, F.R.P.S., upon this happy occasion, and extend our good wishes for its continued successful career in its second half century.

SUB-STANDARD KINEMATOGRAPHY DURING 1942

By George H. Sewell, A.R.P.S.

VERY little amateur film production has taken place during 1942, partly due to stringency in the supply of material, partly because amateur cinematographers were largely young people, and a very high proportion of both sexes are in the Services. It is interesting to put on record, however, that one or two of the older societies are still carrying on quietly, although their activities are confined mostly to projection meetings and outings. These bodies include Beckenham Cine Society, the Cinematograph Section of Birmingham Photographic Society, Redditch Cine and Photographic Society, and Bradford Cine Circle. The Federation of Cinematograph Societies still continues its activities.

Nothing new in the way of equipment has been made generally available, and one result has been an increased interest in the improvisation of equipment, and the building of home-made apparatus. A number of firms have announced special "Sound Conversions" for sub-standard projectors, and a number of entirely home-constructed conversions have been made, with varying degrees of success. All this, however, shows a healthy maintenance of interest.

The biggest activity has been in film libraries, mostly sound subjects, and in spite of restrictions the number of titles available continues to grow. During the year the Royal Society for the Prevention of Accidents embarked on a nation-wide campaign for the preparation of a series of Road Safety Films. The scheme had the approval of the Ministry of War Transport, and was notable in that the society sought the aid of skilled amateurs all over the country, in taking film for the project. In this they had the informed assistance of Mr. G. Wain, the Hon. Secretary of the Federation of Cine Societies.

A large number of Civil Defence films, both professional and amateur have been produced, and during the year the *A.R.P. and N.F.S. Review*, the official journal of Civil Defence in conjunction with the Central Film Library, the British Films Institute, *Amateur Cine World* and the Institute of Civil Defence, prepared a list of sixty-nine films, which are available for use by interested parties.

We have referred elsewhere to the activities of the M.O.I. Film Section, which caused 16 mm. films to be shown to a civilian audience of over

eleven million people during 1942, and which controls the Central Film Library, containing 332 film titles, all of which are available on sub-standard as well as standard 35 mm. film.

Probably the most important single activity during the year was that of the R.P.S. Kinematograph Section, which has been responsible for an outstanding series of meetings dealing with many aspects of kinematography.

Most important of these was a paper by that doyen of the industry, Mr. Arthur Newman, Hon. F.R.P.S., entitled "Early Days of Kinematography," in which he described many of the experiences of the pioneers, and the part he himself played in the early development of the moving picture.

Another important occasion was the showing, by Lieut. Armistead, of the U.S. Navy Film Unit, of the film, "Midway Island," which was the first example to be seen in this country of 35 mm. Technicolor film, enlarged from originals taken on 16 mm. Kodachrome.

Reference should also be made to the paper by Dr. J. Yule Bogue, Professor of Physiology of the Nuffield Research Institute, entitled "The 16 mm. Film and the Dynamics of Living Matter." Here the audience saw films which had revolutionised theories on such matters as the circulation of the blood, and heard of the application of the sub-standard cine camera in widening the range of human knowledge on these subjects.

The healthy tendency towards more adequate training in technical activities was evidenced by an exhibi-

tion of the work of members of the Harrow Technical School, Sub-standard Cine Section. Here the young idea is taught how to shoot in the best manner, at the best subjects. The Polytechnic, Regent Street, is also continuing its activities in training sub-standard cine workers, and has recently concluded a course of lectures given jointly by Messrs. R. H. Cricks, F.R.P.S., Malcolm Hoare, and G. H. Sewell, A.R.P.S.

We welcome the advent of a new organisation, The Association for Scientific Photography, under the Chairmanship of Professor J. Yule Bogue, and we are glad to provide the hospitality of the R.P.S. for the early meetings of that body. Its intention is to bring together all those who are using photography as a scientific tool, and the inspiration for its formation largely came from among members of the Kinematography Section of the R.P.S., who use sub-standard cinematography in this way. Because of the highly specialised nature of the activities of its members, and because those members are scientists rather than photographers, the A.S.P. is functioning as a separate body, and it should have valuable repercussions on the future use of photography and cinematography as a scientific instrument.

One cannot mention in detail the uses which are being made by the Fighting Services of sub-standard cine film, for service and welfare purposes, but it is possible to state that such activities are constantly being expanded. A number of papers on the subject have been given by representatives of the Services to the members of the R.P.S. Kine Group.

SAFETY FILM

S.M.I. RECOMMENDED PRACTICE

The term "Safety Film" as applied to motion picture materials shall refer to materials having a burning time greater than ten seconds and falling into the following classes:

- (a) Support coated with emulsion.
- (b) Any other material upon which or in which an image can be produced.
- (c) The processed products of these materials.
- (d) Uncoated support that is or can be used for motion picture pur-

poses, in conjunction with the aforesaid classes of materials.

The burning time is defined as the time in seconds required for the complete combustion of a sample of the material 36 inches long. . . . This definition was designed specifically to define safety films in terms of the burning rate of the commercial product of any thickness or width used in practice. . . .

All 16 mm. and 8 mm. films must be of the safety type. . . . *Journal of the Society of Motion Picture Engineers, May, 1942.*

CINEMATOGRAPHY IN WAR TIME

II.—THE WORK OF THE U.S. NAVY FILM UNIT

By Lt. M. E. Armistead, U.S.N.

The second of the series of meetings arranged by the Kinematograph Section of The Royal Photographic Society, illustrating some of the applications of cinematography to war time uses, was held at the Twentieth Century Fox Film Studio Theatre, Soho Square, W.1, on November 14th, 1942, with Mr. Arthur S. Newman, Hon. F.R.P.S., in the Chair.

The Chairman said that owing to the fact that 35 mm. films could not be shown at the Society's House, the Twentieth Century Fox Company's Theatre had been put at the Society's disposal. Lt. Armistead would give an account of the U.S. Navy Film Unit and the experiences of the front-line photographers. He welcomed members of the R.A.F., Army and Navy photographers, and members of the Fighting French, U.S., Norwegian and Greek Forces, who were present.

The first lecture in the series, "Entertaining H.M. Forces with 16 mm. Films," was reported in our January issue.

ARMISTEAD described how, after many months of red tape and priority problems, a Film Unit was organised by Commander Ford, for the purpose of making native and documentary films. The exploitation of photography for war-time uses by Italy and Japan, and the part played by the propaganda films, showed convincing proof of the importance of photography, which in action at war could afford to be.

Armistead mentioned in this connection that some of the photographs taken from the Japanese showed clearly that they had information on every house, every military installation, they knew where every tank was, they had photographs of them, and they had a plan worked out to destroy the tanks on the hills at the oil run down into the bay, and fire to an entire island harbour in the Pacific which had become unusable throughout the world over.

He also mentioned the help which cinematography had afforded the Germans in the occupation of the Channel Islands. With the aid of photography they knew every street and house, and had planned their movements and worked out their strategies accordingly. During every day the Germans have photographers going into action to analyse their activities, and thus were able to correct their weaknesses.

With regard to equipment, Lt. Armistead said that this is standard—a "standard" unit consisting of a 35 mm. camera and a 35 mm. Turret Eyemo for black-and-

white work, and a Cine Kodak Special and a Magazine Cine Kodak for 16 mm. colour. A 4in. by 5in. Speed Graphic was provided for still photographs.

Much of the work of the Film Unit was carried out in the air, and some of the problems which had to be solved, such as vibration, cold, etc., concerning which Lt. Armistead replied to questions from the audience during the discussion which followed the meeting.

The film "Midway Island" was then shown. It is the first picture to be released nationally in 35 mm. Technicolor that was shot originally in 16 mm. An appreciation of the film by Mr. George H. Sewell, A.R.P.S., is appended.

The Chairman said they had seen something wonderful, and thanks were due to Lt. Armistead. In answer to a question, Lt. Armistead said that he hoped the film would be released here very shortly. It had already been released in the United States. The film was two months old at the time of the meeting.

Asked how he overcame temperature difficulties in the air, Lt. Armistead said that it was found that in heights of 24,000 feet and at temperatures of 20° below zero, the oil in the Eyemo lens mounts would freeze solid, and they solved the difficulty by taking the oil out of the camera. It was the oil which froze, the camera was taken apart, thoroughly dried out, and it could be run in any temperature so far encountered.

Another questioner asked what prevented the bearings from seizing with no oil, to which the reply was that there had never been any diffi-

culty, and the cameras had not suffered any ill effects. All the films made in northern latitudes were made by cameras without oil. The cameras were brought back, re-oiled, and apparently had suffered no ill effects. With regard to condensation on the lens, most people seemed to take elaborate precautions, but the Unit moistened the end of a handkerchief and wiped it off with no trouble. No lens heaters were used.

At high altitudes the film had to be handled with great care; if this was done there was no difficulty. They had found that heating pads caused damage, so they did nothing, and nothing happened. So far the Unit had not done any night photography, although they were equipped to do so.

With regard to lenses, in the air, long focus lenses from 11-15 inches were used; on the ground, normal photography was made with 2-inch lenses at f/2. A good deal of infra-red film was used, although the normal stock was Plus X.

The Chairman thought that the production of this Unit was something very wonderful. He knew the difficulty of taking raw hands and getting them to do something they had never done before. Then there was the psychological side, and, perhaps, the difficulties with the red tape were the worst, but evidently the Unit was composed of men who got things done, and the film which had been shown justified them.

He proposed from the chair a very hearty vote of thanks to Lt. Armistead, and many good wishes for the future of his Unit, which were accorded by acclamation.

"MIDWAY ISLAND"

An Appreciation by George H. Sewell, A.R.P.S.

This film has two points of interest. Firstly, from a purely technical angle as being the first example brought to our direct notice of film shot in 16 mm. colour and then enlarged to 35 mm. Secondly, as a propaganda film built up from actualities shot under battle conditions.

As to the technical angle, it was demonstrated unmistakably that, when the original camera work is good, the dye-coupled image which is Kodachrome is capable of enlargement to 35 mm. with good preservation of general tonal quality and detail. In making this judgment one has to overlook the imperfect shots in the present film, realising that the cameramen were faced at all times with a rapidly-moving and changing target, and that for most part they were in real danger of their lives. This is evidenced only too clearly by one or two sequences where blast and concussion have momentarily thrown the film out of the gate. That those sequences have been kept in is due to the vision of Commander John Ford, as they perform a dramatic purpose which could hardly be accomplished more forcefully by any other means. It appears to the writer that this susceptibility of enlargement of dye-images from 16 mm. to

35 mm. is a most important landmark in the progress of 16 mm., and that the provision of monochrome dye image films would have the two-fold effect of enabling 16 mm. to be much more greatly enlarged during projection, and of providing news-reel and other cameramen with a more flexible tool with which to supply sequences for inclusion in 35 mm. films for public showing. There are, at the moment, some obvious disadvantages, but these could be overcome in the normal course of development of this new technique.

From the dramatic angle, judging by the effect of its first showing, the film is terrific, and elicited enthusiastic applause. John Ford is a master film-maker, and although we were told he was able to work only with the off-cuts after the preparation of the main official film, he has used this material brilliantly. The theme is just this: That the ordinary boys, the brothers and sons of those in the audience, the kids who a little while ago were walking over the familiar doorstep, are now defending hearth and home in conditions of breathless heroism.

The film, with an amusingly cynical touch, shows the waddling wild birds who are the rightful inhabi-

tants of "Midway," whom Tojo has set out to "protect." At the end of the film they remain much as they were in the beginning. Between those two sequences we are shown some of the preparations for defence, the U.S. establishment on Midway Island, the planes and the boats setting out on their tasks, the enemy attack, the shrieking down of bombs, scattering of buildings, the lazy billowing upwards of vast flames and clouds of oily smoke, the glitter of light on the barrels of guns and the cartridge cases; the eager faces of the gunners. We are shown a little of the sufferings of men who, having crashed into the sea, wait day after day until they are rescued. Some of the heroes are laid to rest with appropriate ceremony.

The main criticism that can be levelled is that one does not gain from the pictures themselves a feeling of the victory gained by the defenders. They endure nobly, but what they accomplished is only stated in a few trite statistical titles near the end. Undoubtedly that was due to shortage of material, and we realised the difficulties; but a few insert shots made afterwards would have been justified here, without meriting any accusation of faking.

To the amateur film maker this was an outstanding object lesson of what can be done with a mass of material necessarily shot to no predetermined plan, edited capably, and then scored with appropriate sound.

III.—BRITISH WAR CORRESPONDENTS IN ACTION

By L. Cave-Chinn, A.R.P.S.

A further meeting of The Royal Photographic Society, arranged by the Kinematograph Section, was held in the Gaumont-British Theatre, Film House, Wardour Street, W.1, on December 19th, 1942, the President Mr. D. MacMaster, F.R.P.S., occupying the chair. The programme for the meeting, which was the third of the series, "Cinematography in War Time," was arranged by Mr. Lovat Cave-Chinn, A.R.P.S., of British Paramount News.

MR. CAVE-CHINN said he would tell a general story of how the news-reel men worked in war time. He went to all sorts of strange places, and the majority of his work consisted of filming things which were very secret, so that they had to be very careful what they said. He hoped that after the war it would be possible to arrange another meeting, at which there would be present many of the camera men now overseas, and who would be able to tell many interesting stories. He explained that he had not been asked to arrange the meeting because he was an outstanding news camera man, but because he was a member of The Royal Photographic Society,

and the Secretary of the Kinematograph Section had asked him to deliver a lecture. He thought, however, that it would be better to try to get some of the "lads" to tell their individual stories. It had been difficult to organise, because the news-reel camera man was on duty seven days a week, twenty-four hours a day; he was subject to being called out at any hour of the day or night. It was not easy, therefore, to lay down any particular programme for any particular date. One or two of the men who had promised to attend had had to go away at the last moment and were unable to be present. Quite a number of the colleagues whom he had approached,

and whom he had seen working under the most terrifying conditions, were horrified at the idea of speaking from a platform! Three of them were now undergoing hospital treatment. The fact that the camera man did get knocked about from time to time while on the job was something which many people did not realise.

There were five news-reel companies in this country: Gaumont, Movietone, Paramount, Pathé, and Universal. There was an average of ten camera men to each company, which only gave approximately fifty news-reel camera men in the British Isles. It would be difficult to cover a world war if each company sent its own man to the various battle fronts.

rota system had been his system had operated on occasions before the war. At the Coronation, in the as obviously not possible news-reel cameras very actual crowning of the re was a camera position t eight yards of the King, s crowned, and two cam-out there, and the films to the other news-reel. In peace-time the allocation of assignments was the News-Reel Association, which all five companies in war-time the Association with the Films Division of the Ministry of Information. A tee was in existence, ited the various Governmentments or Services, and a man was assigned by ittee to a particular war. He remained an f his own company, but npanies shared the cost. went through various nels, and were developed ies, also on a rota, so that necessarily follow that a laboratory would develop l. The processing was strict security conditions y often secret material d. A black-and-white, made from the negative, scanned for censorship d was viewed by all the erved. They made their m that censored negative mber of dupe-positives which were distributed. own company used the ative, a duplicate being other four.

ard to material shot by ilm Unit and the R.A.F. the news-reel companies ed with lavender prints, npanies made the story up vidual way; the editing, r, etc., might vary a good as why the same material nes seen in two different ted in a totally different

stry of Information const all the news camera ies through the Films. Unless a man was ac-that Ministry, he could in war time, because he and and foot by the 'otography Order, made ar, 1939. The penalties almost anything without ere tremendous. Work on for the first few weeks under very great diffi-e companies tried to get reel twice a week, which



L. Cave-Chinn, A.R.P.S.

meant breaking the law at every turn. Several of the operators got locked up by the police. Eventually the Ministry of Information took control and things became easier, subject to the provisions of the Order.

The British Expeditionary Force went off to France, and the first British war correspondents were appointed. War correspondents could be reporters, artists who paint pictures of war, broadcasters, such as Richard Dimbleby or Godfrey Talbot, recording engineers from a broadcasting company not necessarily British, or camera men or sound engineers from the news-reel companies. They all wore the same uniform and insignia; the shoulder titles were "British War Correspondent" in gold, and the cap badge was a large gold "C". They were entitled to be treated as officers, and, if captured by the enemy, they held the status of captain. That was the only occasion on which war correspondents were entitled to a given rank. They were also forbidden to carry arms, which was quite an important point. Several correspondents had been on Commando raids, and had always to carry their war correspondent's licence, because the Germans were liable to shoot them on the spot as spies unless the licence could be produced. The camera men attached to the Navy received a separate licence issued by the Admiralty; their uniform was similar to a naval officer's, except that it had no gold rank insignia, and the cap badge carried the letter "P."

The first party of war correspondents left for France the first week in October, 1939, including representatives of all five news-reel companies. Of those five only one was in England now—Jack Cotter, of Movietone. Two were out east and had had many adventures. Ford, of Paramount, had been through S. Africa, Burma and India;

and Sid. Bonnett, of Gaumont, was in Norway, and, later, managed to escape from Hong Kong. Perhaps one day they would be able to hear their stories. Charles Martin, of Pathé, who was in Cairo now, had got the only pictures of the evacuation of Dunkirk. Ronald Noble, of Universal, after many escapes, was now, unfortunately, a prisoner of war in Italian hands. This brought to mind casualties. Considering the dangers which war correspondents ran, they had been very fortunate. No British camera man had lost his life up to the present in this war. Leslie Murray had the ill-fortune to be very seriously injured in an explosion whilst filming, and the press photographer standing next to him had been killed. Frank Parnell, of Universal, was injured by shrapnel whilst on convoy patrol, but insisted on going back into harness, his arm very much the worse for wear. Candy, of Gaumont, had a swim in the Mediterranean, due to enemy action, was taken prisoner, but had just returned to this country after being released in North Africa. He was at present in hospital. Wood, of Universal, had also had a very unpleasant swim; he had his arm broken just before a "story" started; he got it bound up and shot all his material with a broken arm, and was now in hospital under treatment. All the camera men got safely back from the hurried evacuation from France, but much apparatus, including sound tracks, sound gear and cameras, was lost. It had been somewhat difficult to fit the men out again, owing to the shortage of cameras.

Mr. Cave-Chinn said that he himself went to sea in October, 1939, and had had a grand time with the Navy. He had spent the first Christmas of the war with a contraband patrol, then he had had a trip in the Arctic, and later went to Norway.

Before he introduced the "lads" who were present he would like to pay tribute to the camera men in the Army Film Unit and the R.A.F. Film Unit. He knew the sort of job those men were doing alongside the news-reel men in the various theatres of war, and they were turning in some fine material. The R.A.F. Film Unit had been responsible for some of the best news-reel material of the war. One example in particular was that of the daylight raid by Bostons on France, and also, only a few weeks ago, some really thrilling pictures of the great daylight raid on the Phillips factory, in Holland, and, more recently, the very fine shots of a night raid on Genoa. He had had considerable experience of filming from the air, both day and

night, and wished to "take my hat off" to the R.A.F. Film Unit. His one regret was that there was not better co-operation between the news-reel men, the Army men and the R.A.F. men. It was not the fault of the camera men, but it would be better if they could get together to talk over their difficulties and problems and discuss technical details.

Finally, he wished to pay tribute to all those who kept the camera men in action. They owed a great debt to the men who serviced their cameras: Mr. Newman and his team of fine mechanics, who had produced the camera which was most often used, and who, although they were working at full pitch, always managed to find time to do odd jobs. The camera men's demands were many, sometimes they asked for a gadget for high flying, or a special gadget for the tropics or the Arctic, and by some miracle it was always produced. Bell and Howell must be inundated with demands for service, but they also, as well as the lens makers, found time to

assist. The British produced the finest lenses in the world, and Mr. Cave-Chinn paid a high tribute to the lens makers and to Kodaks for their constantly improving emulsions; the speed and latitude of film was of tremendous value, because the time for shooting a story could not be chosen. The laboratory staffs processed the material under very great war-time difficulties; they worked through the blitz to get it all out in time, and the transport men drove through the bombs so that the next news-reel film could be distributed.

This was a very fine effort, which most people seemed to take as a matter of course. However heavy the raid the night before, the morning newspaper was always expected to be on the breakfast table; in the same way the cinema-goers expected to see the news-reel. He wished again to thank all those who kept the news-reel men and their cameras at work, so that they could bring the war-time news-reels to the screens of the world.

time, and he found the 3in. calculate. The question of it was a ticklish one. He carried his own thousands and it had not been used on ship the vibration was troublesome and when that had to be dealt with, as well as blast from the was better to be working with.

Mr. Graham Thompson said he used filters mostly when time to search for something live. Equipment had to be as possible, and if all the lens fitted with filter holders they more room. Filters were of necessary for good quality graphy, but sometimes equal to be sacrificed for speed and

In reply to a question as to the 4,000 feet not used was the censor, he said that what was cut out, but it had to be mind that they were turning news-reel and not a record they were doing, and that the reel was confined both as to footage. Some of it was because it was redundant; parts because there was no action in them.

Asked how he worked, he said unless a man was on a particular assignment, there was a amount of freedom. The help from the authorities was dependent on how well known. On a strange ship they naturally rather suspicious until got to know one.

Mr. CAVE-CHINN thanked Thompson for coming along.

Commando Raid on V

Mr. CAVE-CHINN said that film to be shown was one of standing news-reel pictures war. It was a mixture of filmed by Jack Ramsden, of tone (he was the first news-reel to go on a Commando raid) Army Film Unit. Mr. Ramsden was unable to be present as he was injured, but the speaker knew him wish to pay a warm tribute to Army camera man. Under regulations one was not allowed to mention names, but he had a good deal.

"CONVOY TO MALT" By David Prosser

Mr. DAVID PROSSER (Movietone News) said that rather an impostor, because not really had so much hard the Mediterranean. Very of went to sea and possibly got a by submarines, E boats and but there was nothing to show and one returned without a

"LANDING AT MADAGASCAR"

By Graham Thompson

The first film to be shown was a news-reel film of the occupation of Madagascar, taken by Mr. Graham Thompson, of Movietone. It was a very good example of "one-man coverage." Mr. Graham Thompson spent some time with the fleet in the Mediterranean, then he went to Madagascar, and after his return from there was present at the raid on Dieppe. Having survived that, he was present at the North African landing, from which he had just returned.

Mr. GRAHAM THOMPSON said that war-time filming was primarily journalistic work with a camera instead of a pencil. Details of equipment, cameras used, and different types of stock, were only details, because the men got used to handling their particular cameras and took for granted the quality of the stock received. It was a question of getting to a particular place and recording what was seen.

Asked if the Eyemo was the principal camera he used in Madagascar, Mr. Thompson said that he used a Newman-Sinclair, although he carried an Eyemo. The Newman-Sinclair held 200 feet of film, which meant half the number of changes.

Asked whether he held it in his hand when in the air, he replied that it was much better to keep it on a stand when in a plane, although the shots seen in the film just shown were

taken with a camera held in the hand. But it was much better to have a stand, so that it could be kept steady.

In reply to Mr. SCHOFIELD, who asked if Mr. Thompson developed his own films, he said no, but the most interesting thing about the work was that he had to bring the films back himself in order to ensure them getting home. Although 5,000 feet were shot, only 800 feet were actually used. They wanted to develop it in Cairo, but he brought it home. With regard to the commentary, one was supposed to keep notes when filming, but he himself rather relied on memory. Most of the notes for the commentary were put together on the way home.

With regard to exposures, strangely enough the time of exposure became absolutely automatic. He did not make any tests. One difficulty was the variation in the climates through which they went. On the way back, in Khartoum, he spent an uncomfortable night with his equipment in an ice box, from which he had had to remove all the wines! The film was tropically packed, but once it was opened the only sealing was camera tape. He mentioned that the most universally used lens was the 2in., but it was a matter of personal choice. He rather liked the combination of 1½in. and 3in., finding the 3in. particularly useful. The question of guessing the distances came in all the

He would try to give some idea of the conditions under which they worked. There were Press liaison officers of the Navy, whose job was to let the war correspondent know when an operation was coming off, and to see that they were in a ship from which it was suitable to film. On the Mediterranean Station it was customary, for various reasons, to live ashore near a telephone, so that it was easy to go straight to the docks or harbour and get a boat to join one's ship as quickly as possible. For major operations information was obtained from a Press office. It was a question of the fact that certain ships were going to sea, but from one's own sources it might be possible to discover a little more, and thus have a better ship than the one to which the correspondent had been assigned, and he could ask to be transferred. With regard to uniforms, they had an ordinary naval cap with the letters "N.P." substituted for the own, and on the sleeves of the coat there was a tab, "British Naval News-reel Correspondent." The processing was done in Cairo, either by Kodak or an Egyptian film company. The negative was not flown home direct as a rule, but duplicates were made, from which it was possible to get further negatives. They were flown home by the quickest possible route, copies being flown to America, South Africa and Australia, and as soon as news came that the duplicate had arrived the negative was despatched.

All the work was not done at sea. Mr. Prosser had spent some time in the Western Desert, because when Tobruk was isolated the Navy had to keep it supplied. This was done at great cost in ships and lives and material wear and tear on the men doing the job in the destroyers and small craft. Some of the small ships were just little wooden sailing vessels which used to sail up and down the coast. They had small guns and rifles, perhaps nothing more than one or two machine guns, and used to go on this trip into Tobruk with supplies, being machine-gunned and bombed by enemy aircraft, with practically no protection. There was a story of one of these little ships which had an auxiliary engine. It did not have full navigating facilities, and to navigate along that coast was not easy, because there were a lot of little bays and inlets with very peculiar currents. A little way past Tobruk there was a little bay called Bomba, and the captain of this little ship, whom Mr. Prosser knew quite well, sailed into Bomba by mistake. He turned round and sailed out again. Daylight came, and as he was sailing along the

coast a couple of Me's arrived and instead of shooting him they gave him escort until their fuel began to give out, when they made off. A Blenheim met them, and, having seen the Me's, thought it was an enemy ship, and came in to attack, but did not do much damage. Finally, the little ship got safely in, having had enemy fighter escort.

From the point of view of the cameras, the sand was a very major enemy. One could not get away from sand in the Western Desert, however carefully the cameras were closed. In a sandstorm nothing could prevent the sand getting in. They had to be cleaned out many times a day; it was a problem which had never been overcome, but the manufacturers had done wonders, and he never had any trouble with his Newman-Sinclair. It had been in heavy storms at sea and got corroded, although he rubbed it down with boiled linseed oil, but the camera never let him down, which was a triumph for the makers.

In Tobruk

In Tobruk, the question of landing at night was a problem. There was a lot of gear to carry. One arrived in a destroyer at night, with, usually, an air raid on and a lot of ack-ack fire. Ships did not fire unless they were actually attacked. There were very few landing stages left, and the harbour was literally full of sunken ships and navigation was a major problem. The ship berthed perhaps by a sunken ship or a quay, and then one had to get one's gear off. There were two cameras, a tripod, a bed roll, which contained all his personal belongings, and it meant two or three journeys to get it off. Then a truck took one off into the desert.

It was normal to work from a truck provided either by the Naval or the Army authorities. Trucks were very short, and a process known as "cannibalisation" used to go on, which involved getting old trucks and using their parts to patch up other vehicles. It was incredible how the supply of transport was kept up. When there was a tank attack, if it was practicable, he went in a truck, if not, on foot. On one occasion the tanks broke out to the south of Tobruk. There was a perimeter round the town which was anything from five to nine miles deep with a very powerful defence. On this particular occasion he was with a unit of tanks. A tank battle was incredibly difficult to photograph, because it was immersed in a great cloud of sand, and they were spread out over an area of miles. It was almost like a series of naval battles. An Army Film Unit man and himself had gone out to-

gether to see what they could find. There were a number of German tanks burning, and they thought the area was cleared so they went out on foot. The truck with the equipment was sheltering on top of an escarpment behind some tanks. They were being shelled heavily all the time by anti-personnel shells, which burst with a very great spread. When the two men were about a mile from the truck they found they were being shelled by small shells. They were in open country with machine gun posts here and there, and they did not know where the small shells were coming from, not realising that they were tank shells. He saw the other man start to run towards the truck and he ran too. It was the only time he wished he had an Eyemo camera, because when he started to run the camera was very cumbersome. The Army man had an Eyemo and could run a little faster; the shells were popping all round, and then the tanks drove away and a few minutes later the truck drove away, while the German tanks were still chasing him. Just as they got to the escarpment, some armoured cars went out to meet the Germans. He had never had to run quite so far with quite so much gear in his life, and was amazed at the time he made it in.

With regard to working in ships, a lot of the work was concerned with Malta convoys. The first was in January, 1942, when he was on the *Ark Royal*, having lived in her for about four months. One of the drawbacks of working in destroyers was the speed at which they generally worked, which made too much engine vibration, or there was too much of a sea for the camera to be kept reasonably steady, so he used to try to get in a cruiser.

The convoy was that of March, 1942, known as the Medina battle, when four light cruisers beat off an Italian battle squadron and got the convoy to Malta. It was under Admiral Vian, and he did a wonderful job of work. There was a large convoy, and after starting there were a few sporadic attacks. One got used to expecting submarines and air attacks, and the captain of any ship was on the bridge the whole time. Occasionally he would get a short sleep on a camp bed on the bridge. Mr. Prosser said he usually worked from the bridge, where he could see all round the ship, and there were the least number of obstructions. The difficulties were that there was usually a fair sea running, or enough to make it a little shaky, and the tripod could not be used, and the camera had to be held in the hand. There was a large area over which to photograph, and there-

fore it was impracticable to use anything but a 4in. lens, although he preferred the 1½in. to 3in. lenses for ordinary purposes, for which they were ideal. There was a particular class of cruiser, with very heavy armament, which was equally good for anti-aircraft and ordinary action, and there was a tremendous blast from them. It was not practical to use the tripod, because nine times out of ten the camera was blown off the legs by the blast, so he held it in his hand, or sometimes with a sling with a leather strap over one shoulder and a short unipod screwed into the camera. That helped a lot, because he could ram himself into a corner and wedge the camera in too, and roll with the ship while the body absorbed the vibration.

On another occasion, on the *Ark Royal*, when she was on convoy duty, he positioned himself between two gun turrets. She had a lot of small ack-ack guns; he knew the fighters had taken off, but he did not know about these guns. He saw the first lot of bombs drop about four miles away, he put his camera up and switched on. Some aircraft came over about 14,000 feet up, and they could not be seen with the naked eye. The two turrets on either side of him opened up, four guns almost simultaneously, and to his amazement his camera stopped. The explanation was that the blast had blown the film out of the gate and jammed the camera.

At the other end of the Mediterranean there were air attacks going on simultaneously with submarine attacks, and at night there were E boats as well, so that there might be attacks from three different points. A ship he was on was torpedoed, but did not sink. There was an E boat on one side and a submarine on the other, and there were some aircraft about. One never knew where to look by day or night on many of these occasions. On the convoy, when they met the Italian fleet, the convoy was left to the south and the fleet turned away to engage the Italians, and huge smoke screens were put up, which made it very difficult to photograph anything. All one saw of the enemy on that occasion was a big flash from the guns, and occasionally, when the smoke broke, the ships themselves could be seen on the horizon. He did not think any camera man managed to get any pictures of the enemy on that occasion.

As far as filters were concerned, Mr. Prosser said that he kept a filter on practically all the time, sometimes red, sometimes yellow or orange. He found that he almost invariably needed one, otherwise he

got a dead white sky and a dead black sea, and as there was always enough light he kept a filter in.

On the question of gun fire, it was of some interest to know that the flash of a gun lasted for only one frame of the film. Every time the guns fired there was a blinding flash, and one was momentarily blinded, so the camera was lined up before the guns fired, and when he heard the warning bell he would shut his eyes.

He wore an anti-flash helmet and gloves for protection against burns.

Mr. CAVE-CHINN thanked Mr. Prosser for his talk, which was followed by a film of a Malta convoy, taken by Mr. Prosser and Mr. Ewings of Gaumont-British.

The last speaker was Mr. Kenneth Gordon, of Pathé. Mr. CAVE-CHINN said he was an old-timer, having been a war correspondent in the Balkan War of 1911.

FILMING EARLIER WARS

By Kenneth Gordon

MR. KENNETH GORDON wished to pay tribute to a man who was still alive, and who was the first war correspondent camera man in the world -- Joe Rosenthal who went to the South African War and the Russo-Japanese War, with an old Biograph camera, which perforated its own film. He was the founder of war cinematography, and got some very excellent pictures. Mr. Gordon said he had seen many of the old Biograph films, and their photography was marvellous.

He himself went to the Balkan War as a camera man. Mr. Newman was not then building cameras such as were available to-day, and he had a camera which had to be worked with a tripod. There was no clockwork mechanism, the gear had to be packed on horses. Sir Hubert Wilkins, of Arctic fame, was with him on that occasion, and turned up with a "Matchless" motor cycle and sidecar -- the first war correspondent to use an internal combustion engine -- but he was always in the bog. He was there for Gaumont, and Mr. Gordon was working for Pathé-Jury. The Balkan War was the first war in which aeroplanes were used for reconnaissance. The men now had to face up to far greater dangers than were ever conceived in those days, but thanks to the stock, thanks to the camera, and to a very fine breed of young fellows, they were able to get the good pictures which had been seen. The best parts were clipped out, and one day, perhaps, the rest would be able to be seen; it would make an epic film. He believed all the films were preserved.

Mr. Gordon also went to the North Russian War as an Army camera man. He had to conform to military discipline. He remembered having to blow up the ammunition dumps; he laid his charges with the sappers and then hurried off to film it being blown up.

Mr. Newman had helped tremendously in enabling camera men to produce the pictures of to day; they

were all proud to be handling the Newman camera.

When Mr. Gordon was engaged by Pathé he was engaged as a war correspondent and went to Ireland, where he was more concerned with politics than a camera; one's greatest effort being to avoid being shot by either side. He was still taking war pictures, and although he had not done anything very marvellous he was still hoping.

With regard to filters, he thought they were essential for modern stock. He always put in a filter to get a little correction, even in the worst weather. With the vast improvements in materials, they almost ceased to be photographers; they relied entirely on the stock maker, the laboratories and Mr. Newman, who made a very good camera.

The PRESIDENT said they were tremendously indebted to Mr. Cave-Chinn for a very enjoyable afternoon. The arrangement of the programme must have entailed many weeks of work, and he proposed a most hearty vote of thanks to him, to the speakers, and to the projectionist who had shown the pictures. The vote of thanks was accorded by applause, and those present examined the various cameras on view with interest.

The Photographic Convention

A meeting of the members of the Photographic Convention will be held at 16, Prince's Gate, S.W.7, on Wednesday, May 5th, 1943, at 3 p.m., by invitation of The Royal Photographic Society.

The President, Mr. W. P. Trebilco, A.R.P.S., and Mr. G. C. Weston, Hon. F.R.P.S., have arranged a cine display of Convention films taken at Exeter in 1939. The Central Association of Photographic Societies Annual Exhibition will be on view. It is hoped that afternoon tea can be provided for members, if war-time conditions allow.

Will members desiring to be present kindly inform the Assistant Secretary, Miss E. A. Beattie, A.R.P.S., 67, King's Road, Bournemouth, of their intention to attend, before April 30th, 1943?

SOME NEW TECHNIQUES FOR MULTIGRADE*

By L. V. Chilton, M.A., F.Inst.P., F.R.P.S.

MULTIGRADE paper was introduced in the late spring of 1940, when it was first demonstrated before this Society by its originator, Mr. F. F. Renwick†. As you will recall, it is a new development paper, broadly similar in many properties to ordinary Bromide papers, and it can be used for any purpose to which Bromide papers are suited. Its unique and characteristic feature is that its contrast can be varied at will by the user, and the range of contrasts which it yields covers, broadly speaking, the entire range for which five or six grades of Bromide paper have been used in the past.

It is evident that the introduction of such an epoch-making product as Multigrade would have had more profound effects in normal times than during the war, but if the war has necessarily prevented many people from using Multigrade who might otherwise have done so, it has, at the same time, permitted the manufacturers of the paper to study its properties more closely and to introduce improved working techniques and better light filters.

Before Multigrade was introduced, the photographer had available a small number of contrast grades of Bromide paper, and the experienced worker tended to select one particular grade or another for his prints. To get the best possible prints on this paper, he had to attempt to get a standardised negative, and, of course, to use standardised printing procedure. Now, "standardised negative" is a phrase easy to say quickly, but it involves many factors, only some of which are under the complete control of the operator. He can work with a carefully made up developer and he can develop his negative either by time and temperature methods, which will give him a standard gamma value but will not take into account the differences between subjects, or errors in exposure; or he can use a factorial method of development, which, while compensating in some measure for exposure errors, leaves

him with a negative of which the gamma value varies according to the development time used. Whichever method he adopts, however, the ultimate range of densities in his negative still depends upon the character of the subject. It will be greater for long-range subjects than for short, greater for subjects containing extremes of lighting than for those with flatter and more uniform lighting. Now, to obtain a full-range print on his selected printing paper, the operator has to ensure by some means that the range of densities in his negative fits the "negative density-range," or "exposure scale," of his printing paper. If the two do not fit, he may attempt, by general or local intensification or reduction, to alter the density range of the negative to make it fit the paper.

Alternatively, he may take the negative as straight development gives it and then attempt to modify the effective contrast-giving properties of his printing paper by one of a variety of means, e.g., by over-printing and local reducing, or by using a modified developer. All these difficulties are present for the critical worker who attempts to make first-class prints from a variety of subjects, although the man who confines his work strictly to one type of subject, over the lighting of which he has complete control, and who always uses standardised lighting and standardised technique in developing and printing his negative, may not become aware of the limitations until he attempts to make a variation at some stage in the procedure. Then he may well find he just cannot get the sort of result he wants without a complete overhaul of his system from camera to print. As soon as the worker starts taking a variety of subjects, especially if he uses roll film in any form, and particularly in the form of miniature film, printing difficulties immediately demand his careful attention. His roll of negatives has to be developed as a whole and the density ranges of individual negatives in the roll depend, of course, upon the brightness ranges of the subjects represented. Each, therefore, requires individual treatment in printing, and the most important single factor in printing is the contrast level of the paper, which is largely fixed by the manufacturer and is not susceptible

of much variation in the course of processing, without attendant disadvantages. The manufacturers of Multigrade have, therefore, produced a paper of which, as I have said at the beginning, the contrast can be varied at will by the user.

What Multigrade Is

Multigrade can be regarded as a Bromide paper which, though a little slower than the average run of such papers, is yet fast enough to permit its use for enlargement. Its processing is carried out exactly like that of conventional Bromide papers, and it can be safely handled in the light of the recommended safelight (Ilford "S"), which, as is well known, has been in use for many years as a conventional Bromide paper safelight. The unique feature of Multigrade, its controllable contrast, arises from the fact that it is coated with a mixture of two different emulsions. The first is a very soft-working emulsion having the usual colour sensitivity, or lack of colour sensitivity in the ordinary sense of the term, of Bromide papers; and the second, an emulsion of very high contrast and sensitised in the blue-green region of the spectrum. To a close approximation, the effective sensitivity ranges of these two components are mutually exclusive, light of longer wavelength than 4800Å giving a print of high contrast and light of shorter wavelengths giving prints of very soft contrast. Intermediate contrast levels can evidently be obtained by using, in the printing operation, light whose composition consists partly of components of longer wavelength than 4800Å and partly of the shorter wavelengths; and if the relative amounts of these two components are varied, the resulting contrast may be likewise adjusted in any desired manner between the two extremes.

Multigrade as "Six Contrasts in One"

The first, and, in some respects, the simplest way of varying the colour of the printing light, is by means of a range of filters. If we take five different filters of different depths, which are so arranged as to pass progressively less and less of the blue region of the spectrum, we get five different levels of contrast in Multigrade. Add to these five a sixth level, obtained with no filter at

* This report is based on a lecture given by the author at the Meeting of The Royal Photographic Society, arranged by the Miniature Camera Group, held at 16, Prince's Gate, S.W.7, on February 27th, 1943, with Mr. Percy W. Harris, F.R.P.S., in the chair.

† F. F. Renwick, *Phot. J.*, 80, 320-325, August, 1940.



Fig. 1 (a)

No filter

(b)

M.4

(c)

M.6

all, and we have with one paper, processed in one standard fashion, six different levels of contrast (Table I).

Table I

Equivalent Ilford Bromide Grade	Multigrade Filter	Colour
No.		
1 Soft	No filter	—
2 Normal	M.4	Pale yellow
3 Vigorous	M.6	Light yellow
4 Contrasty	M.8	Medium yellow
5 Extra Contrasty	M.10	Deep yellow
6 Ultra Contrasty	M.12	MASTER yellow

In the Multigrade filter series, care has been taken to ensure that there will exist equal steps of subjective contrast, i.e., of contrast judged by the eye, between prints made with any one of the filters and prints made with the next filter in the series; and it will be evident that such an adjustment can be made with far greater precision when designing a set of filters relating to one paper than when making a series of separate Bromide emulsions.

The First Method of Exposing Multigrade

The first method of exposing Multigrade is, therefore, the following: The user inspects his negative and estimates what grade of Ilford Bromide paper would normally be required. He then makes his expo-

sure through the Multigrade filter corresponding to this grade. Of course, it will usually be necessary for him to make test strips or test prints through the chosen filter, just as he would find it necessary to make similar test exposures with the selected grade of Bromide paper. We have found it convenient to make such a test exposure by laying a strip of paper on the easel of the enlarger to cover a part of the subject chosen to contain extreme highlight and shadow regions, in fact, to take in a representative sample of the subject as a whole; and if a series of test exposures is made it is, perhaps, desirable to add that the exposure should be increased from one test strip to the next by a constant factor. For example, in the case of prints made to white light (equivalent to Ilford Grade 1 Bromide) successive test strips might have their exposures increased by 50 per cent in the first place, i.e., in the series 10, 15, 22, 33, 50 seconds, and so on. On the other hand, when printing at a high contrast level, as with the M.10 filter (Ilford Grade 5 Bromide), a smaller multiplier should be used in this case, perhaps a 20 per cent increase, such as a series 10, 12, 14, 17, 21. This practice in no wise differs from that found most satisfactory when printing on Bromide paper.

Fig. 1 (a)-(f) shows a set of six prints on Multigrade obtained from the same negative, with the respective filters.

By itself, this first method of using Multigrade represents a very considerable step forward. The simple expedient of exposing Multigrade with different filters now means

that the user need stock only as many boxes of Multigrade as he desires surfaces, probably two or three at the very most.

Multigrade as a Paper of Continuously Adjustable Contrast

But Multigrade goes much further than this, however, since it makes possible the production of prints having any desired contrast between two far separated extremes. It permits of very delicate variations in the contrast of a print about the level which any one single filter would make possible. To my mind it is this property of Multigrade by which, in making a print, the user can control as finely as he desires, not only the exposure which he gives, but also the contrast level of his print, that constitutes the real advantage which this paper offers.

The Second Method of Exposing Multigrade

The second method of exposing Multigrade employs a composite exposure in which, for part of the exposure time, white light is used, and, for the remaining part, light filtered by the M.12 or Master filter. The relative durations of the two part-exposures can be varied in quite continuous stages from what we may call 100 per cent white light to 100 per cent yellow light, and the order in which these two part-exposures are given makes no difference to the result.

If the exposure is given wholly through the M.12 filter we obtain, of course, the upper extreme of contrast corresponding to Ilford Bromide Grade 6. Alternatively, a



(d)

M8



(e)

M10



(f)

M12

...nting exposure compounded of, say, three-tenths to white light and even-tenths through the M.12 filter will make the paper behave like Grade 4 Bromide paper, or six-tenths of white light and four-tenths through the M.12 filter will give a result similar to that yielded by Grade 2 Bromide paper. The pairs of figures 1 and 7, 6 and 4, etc., are called the "contrast factors," or "contrast indices," of the paper, because they indicate the manner in which the required exposure should be compounded of white light and of light filtered through the M.12 Master filter to give a result corresponding to a particular grade of Bromide paper (see Table II).

Table II

Equivalent Bromide Grade	Contrast Factors	
	Unfilt'd $\frac{1}{2}$ -watt Light	Yellow
No.		
1 Soft	10	—
2 Normal	6	4
3 Vigorous	4	6
4 Contrasty	3	7
5 Extra Contrasty	1	9
6 Ultra Contrasty	—	10

Now, we must remember that these "contrast factors" do not give exactly the relative exposure times of white and filtered light. This is simply because the M.12 filter, like any other filter, acts by cutting out some of the light which falls upon it; and, inevitably whenever an expo-

sure is made with the aid of a filter, a longer exposure time will be necessary than without it. This fact is, of course, quite familiar, and is met in practice by the use of what is known as a filter factor. In ordinary filter practice as, for example, when using a correction filter with panchromatic material, the contrast of the image obtained on the material is practically identical whether the filter is used or not, and the filter factor of such a filter has a perfectly well-defined and unique significance. What are we to say, however, of the filter factor for use with a material like Multigrade, when the actual contrast obtained with the filter is so radically different from that obtained with unfiltered white light? It is the old problem how are we to compare the speeds of two materials which differ widely in contrast? Now here I have a pair of out size stepped exposure scales obtained with Multigrade, the first from exposures to white light, and the second from exposures to the same white light, filtered with the M.12 Master filter (see Fig. 2). Each of the scales was made by uniformly exposing small pieces of Multigrade paper on the easel of an enlarger, the exposure increment in passing from each step to the next being about one-eighth (actually, the increment in log. E was 0.05). As expected, the exposure scale obtained with unfiltered light shows only a small increase in density from each step to the next, and to produce the entire range of densities from clear base to maximum black of the paper required something over forty steps of exposure corresponding to about 100:1. On the other hand, the exposure scale produced with the aid

of the M.12 filter is of very high contrast and the transition from clear base to maximum density of the paper requires only some fourteen to sixteen steps which, at 0.05 a time, corresponds to a total log. range of 0.7-0.8, or an exposure range of between 5:1 and 6:1. (These exposure scales were attached to characteristic curves for the material, as shown in Fig. 2. The "soft" or white light scale was attached to the base of the mount carrying the white light characteristic, and the "hard" or M.12 scale was attached to a transparent sheet of celluloid carrying the M.12 characteristic).

If these two scales are put side by side with their high density ends in register (Fig. 2 (a)) the densities on the yellow-exposed scale lag at every point behind those obtained on the scale exposed to half-watt light. They lag behind very far at the lower densities, less far at medium densities, and very little indeed at the maximum density end. If we are going to talk about a filter factor for Multigrade, obviously the factor will depend upon the level of density chosen for the measurement. We can get an idea of this filter factor (or exposure ratio) by sliding one of these scales alongside the other until the exposure is deemed to have been balanced at some particular density, and the amount of sliding necessary gives us a measure of the filter factor for that density. In fact, if I slide the yellow exposed scale along the half-watt exposed scale until the two scales correspond at a density of about 0.6, we see that the filter factor is about 8 (Fig. 2 (c)). If, on the other hand, I move the yellow filter scale back until a balance is achieved at a

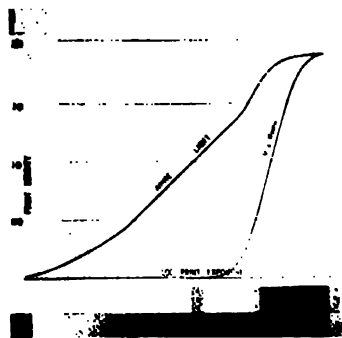
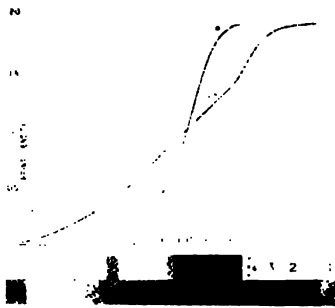
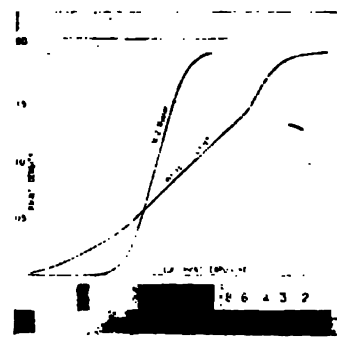


Fig. 2 (a)



(b)



(c)

middle-tone density of 1.0, the filter factor is less, about 4 (Fig. 2 (b)). If we are going to attempt to give a single filter factor which will be somewhere near the mark for all purposes, we must choose a comparison somewhere in the middle tones; and we have, in fact, chosen a middle-tone density of 1 at which the filter factor of M.12 is about 4.

Return now to the contrast factors of Table II. To obtain a result with Multigrade similar to that given by Grade 4 Bromide requires "contrast factors," of 3:7, i.e., an effective exposure ratio of three-tenths to white light, plus seven-tenths to M.12. Multiply those seven-tenths by the filter factor 4 and we have the actual exposure times of three units of time to white light, plus 4 by 7 = 28 units, through the M.12 filter. The same procedure would be used had we judged some other Bromide grade to have been suitable for a particular negative.

To apply this method now in the printing of a particular negative we have got to attach a value to the unit of time 1 was just speaking about, and that usually means making a test of some sort. The best test is, in our opinion, the one recommended in the instruction leaflet, namely, to make a test strip, or, if thought necessary, a complete test print, to white light only, and to find out what exposure time is necessary to print the middle-tone densities of the subject at the density which they are required to have in the final print. Since Multigrade exposed to half-watt light behaves like a soft Bromide paper, prints obtained with white light will in general and from the majority of negatives be softer prints than the negatives really require. If the middle tones are correctly exposed, the highlights will appear denser than they have ultimately to be, and the shadows will not be so dark. In using this technique we have found, and doubtless many of you have found

also, that some practice is required to get a correctly exposed test print. In the case of an outdoor subject, or of any subject which would normally be printed with tones well-distributed over the entire range from white to black, a correctly exposed test print will be one of which the first impression is that while its average depth is about right it is simply soft, not that it is over-exposed or under-exposed. This may sound a truism, but provided that the first impression of the test print is of the contrast being out, and not of the exposure being out, one can be pretty sure that the exposure cannot be far out.

Note that when making test prints, as when making the finished print, it is essential to apply full development, viz, two minutes at 65°F. in ID20, or a similar standard paper developer. This is because, with Multigrade, the shadows tend to develop first and the lightest tones last. Hence Recommendation No. 1 - develop out your test strip or test print completely, even though it is only a test. Recommendation No. 2 is to examine the test print in a really good white light. Even highly skilled and experienced printers will be aware that a print cannot be judged satisfactorily unless it is viewed in a good white light, and this applies no more to Multigrade than to Bromide papers of conventional type.

Now, with practice, the application of the second method of exposing Multigrade will be found quite straightforward for the average outdoor subject, or for still-life subjects, in which the tones are well distributed over the entire range of the paper. A little difficulty may be met at first in applying the method to special types of subjects such as portraits, of which the greater part - the essential part from the point of view of print judgment - will be finally printed at a density level somewhat removed from the standard middle-tone density of 1, which we have been con-

sidering so far, and which has been taken in fixing the filter factor of 4. In ordinary portraits the flesh tint are represented for the most part at lower densities than 1. If, therefore, in making portrait prints we first make a test print in which those parts intended to be printed at middle-tone density of 1 are correctly exposed, then the flesh tints will come out heavier than they are ultimately required, and the test print may, in consequence, appear somewhat over-exposed, even though its middle tones are correctly printed. With a little practice the user will learn to take account of this.

We have taken the view that those new to Multigrade, those coming from the field of conventional bromide paper and accustomed to judge negatives in terms of bromide paper grades, would be advised to adopt a method in which the filter factor can be assigned a single fixed value, even though this involves some training in the judgment of test print on the lines which I have just discussed. Once, however, the user has passed through the stage of referring always to the corresponding bromide paper grades he can, if he wishes, adopt an alternative method, using a rather different type of white light test print. In this alternative method he considers first of all from the nature of the negative what is to be the main feature of his picture, and what should be its approximate position on the scale of print densities. He then makes a test print to half-watt light which gives this central feature the approximately correct density according to this judgment, and then having found this best test exposure divides it into two parts as previously, but with a filter factor which depends on the level at which the center has been printed. Now, for sorts of different subject, at all sorts of dominant density, and it would be quite misleading to suggest that a different filter factor

be used every time a print of a subject is made. But it is possible by dividing subjects into three types to allot filters to be employed with those and we have then a system some may find to permit a satisfactory judgment of the exposure for the test print. For example, in portraits one could use a white-light test print in which the average density of the highlights was about right, say 0.5.

Obviously in such a print all deeper tones would be rendered too light, and the extreme highlights would be somewhat veiled. The print would have a somewhat faded-out appearance. If, now, a test exposure is given using a factor of 8, a satisfactory final print will be obtained. It will be from the exposure scales of

(c) that a filter factor of 8 corresponds to a density of approximately 0.6, and such a density would be considered typical of the average highlights in a portrait. Let us now see that a test print of a portrait made in this way, and that the exposure is twenty seconds. The over-contrast level is ultimately decided and we shall have to give one of the final exposures to white light and the remainder, multiplied by eight, through the yellow filter. In a similar case it might be that some of these twenty seconds be given to white light and the

remaining 6/10ths, multiplied by eight, through the M.12 filter, i.e., eight seconds to white light and $12 \times 8 = 96$ seconds through the yellow filter. If any adjustment of contrast was wanted, then for every one second change in the white light exposure given there should be a corresponding eight second compensatory change in the yellow exposure.

Two Separate Controls Needed in Making a Print

Now, I want to digress for a few minutes to discuss in general terms the controls necessary in making prints from negatives. This afternoon I have described two methods with Multigrade. In the first method, the contrast level was selected and test exposures made with the appropriate filter, and, in the second, we made a test print for exposure and then applied an adjustment for contrast. Whatever method we use in making a print from a negative, two such separate adjustments have always to be made, whether we realise it or not.

From the point of view of their tone range, negatives differ from one another in contrast, and they differ from one another in depth, and, broadly speaking, the depth and the contrast of the negative are quite independent. The contrast of the negative, i.e., the range of densities it contains, has to be compensated by

the contrast of the printing material, and its density has to be compensated by varying the time of exposure. The contrast of the print and the exposure of the print are likewise two separate things and they have to be chosen and provided separately.

In Multigrade, the contrast or range factor is linked with the colour of the printing light and the density or depth factor is linked with the time of exposure or the intensity of the printing light; and however much the two factors may be disguised, provided some operation is carried out in making the print which bears upon the colour of the printing light, and some other operation which bears upon the amount of exposure to be given, we shall have a basis for a satisfactory method of producing the exact best exposure conditions. I say this because a variety of methods for estimating the best exposures with Multigrade has been proposed in the Press and before photographic societies. We have had methods based upon the exposure required for highlights or for shadows, using the yellow filter only, and leading to the ingenious slide-rule system of Fonseca and Hart, described in the *Miniature Camera World**. We have had our own earlier method, in which a test strip was made using blue light for the highlights of the print, and, super-

* E. J. Hart and H. d'A. Fonseca, *Min. Cam. World*, 5, 200-201, April, 1941.



Fig. 3 (a)



(b)

Example of local contrast control

imposed on this, a second test strip using yellow light for the shadows. We have also had the method proposed by Mr. O. C. Cabot in lectures to photographic societies, based on what he calls "equal blacks." Again, we have the present techniques which I have been describing, particularly that in which the test exposure is made to white light, and then, from an estimate of the contrast of the negative, split exposures are given in making the print partly to yellow and partly to white light. Doubtless, there will be many more systems proposed from time to time depending on the fact that two fixed extremes of contrast are possible with Multigrade, with and without the M.12 filter respectively, and that the sensitivities of the corresponding components in the paper are related to one another in a fixed fashion.

What we have to do in a practical method is so to arrange our procedure that each step we take in determining contrast or exposure helps to fix the other step required, so that a test strip obtained in fixing exposure shall, for example, help to confirm or modify the judgment already formed from the negative as to the contrast required. We believe that the white-plus-yellow technique of exposing Multigrade, as I have developed it this afternoon, does fulfil this condition. Quite apart from the white light test print, the user will have inspected his negative and will have formed some estimate as to the contrast level at which he requires to work his printing paper. When he makes his white light test exposure, he not merely determines what is the best exposure required, but he has in front of him a test print which departs from his ultimate requirement by an amount dependent on the actual contrast level which he really needs. If his test print is not merely right for exposure, but for contrast also, then, as he may already have judged, his negative requires to be printed on soft paper, i.e., on Multigrade with white light exposure only. If his test print is only a little softer than he finally needs, then his previous opinion that No. 2 Grade paper is required receives further support, and so on.

Development for the Highest Contrasts with Multigrade

I have stressed so far the necessity of standardising development when using Multigrade. The only exception to this, and one which only rarely comes into question, is aimed at getting the very last ounce of contrast out of Multigrade when dealing with exceptionally thin ghost negatives. In such cases it will be

found that slight extra cut can be obtained in the higher lights of the print if the print is fully exposed and under-developed. Naturally, in dealing with such negatives—and I have in mind only exceptionally thin negatives—one would not make a white light test print since obviously the negative would require to be printed through the yellow filter only. In a particular case, suppose a test print has been made with the M.12 filter and that normal development had required an exposure time of thirty seconds. Then it will be found that if the exposure is increased by one-third, i.e., to forty seconds, and the development cut back by one-third, i.e., to one minute twenty seconds at 65°F. instead of two minutes, a very similar print will be obtained, but with the slight additional cut in the highlights to which I referred.

Local Contrast Control with Multigrade

I wish now to pass to another application of Multigrade paper which would not be possible with any ordinary Bromide paper. We have already shown how, by modifying the effective colour of the printing light, Multigrade can be made to behave as a paper having any desired contrast level. Now we shall consider Multigrade as a paper whose contrast is adjustable *within the area of a single sheet*. In other words, we shall show how contrast can be controlled locally in selected parts of the subject during the printing operation. The pictorial worker has long been in the habit of applying

local shading during printing, holding back this or that part of his print with the aid of masks or diffusers, or simply with his hands arranged to cast a suitably shaped shadow on the easel of the enlarger. These devices have, however, effected simply a control of the local *exposure*. The control of local *contrast* has been possible only by means of elaborate procedures such as that of Person, involving intermediate photographic masks*. Now, with Multigrade, it is simply a case of printing part of the subject through one filter and part through another, in any combination at the whim of the user; and while, doubtless, many users will indulge in such practices to secure results which might be more easily attained, cases arise where this power of local control achieves results otherwise quite impossible. Local contrast control can be used for two distinct purposes (of which examples were shown).

(A) When the negative contains detail at widely different density levels and it is desired to reproduce all this detail at more nearly the same level in the print.

(B) Where the detail in the negative is distributed in a normal fashion, but it is desired to bring out some parts of the subject at a much higher contrast level than others in the final print for the sake of emphasis.

The examples of treatment (A) include:—

1. Printing up highlight detail (as

* A. Person, "Bildmässige Leica-Photos durch Tontrennung" (Frankfurt; Second Edn., 1935). W. Peterhans, "Das Entwickeln Entschieden" (Halle, 1935).



Fig. 4. Contrast Control in Commercial Photography

in white dresses) by white light, the remainder of the subject being printed at a higher contrast level.

2. Putting detail into shadow regions of the print by printing these through the Master yellow filter, the remainder of the subject having been printed at a somewhat lower contrast level as required by the negative. An example of this is shown in Fig. 3. Here we have a sunset scene, against the light, in which the negative was of such a long range that overall printing even to white light failed to resolve the foreground when the sky was correctly exposed. The first print shows the effect of applying a conventional procedure—printing all to white light, but holding back the foreground for ten seconds out of a total of thirty. The foreground is just beginning to be resolved, but at a low contrast level. In the second print the sky was again printed thirty seconds to white light, but the foreground was held back during this exposure and subsequently printed in for ten seconds through the Master yellow filter.

Method (B), on the other hand, is not likely to be used so much in ordinary pictorial work as in commercial photography, particularly in the photographing of engineering subjects, where, for example, it is often desired to show one part of the

machine in full-bodied contrasty form, the remainder of the machine appearing as a very low contrast wash. Hitherto the successful production of such prints has required methods using photomontage or local airbrush, and re-photographing. In the example shown (Fig. 4) the technique employed was (a), a straight enlargement was made with the negative in position in the enlarger at the desired degree of magnification; (b) this print was dry-mounted on black paper; (c) a window was cut out of this black-mounted print, just inside the line of perforations of the stamps shown in the picture, thus giving two masks, an inner one and an outer one; (d) the outer mask was positioned on the easel of the enlarger over a sheet of Multigrade paper and the stamps exposed using the M.12 filter; (e) the inner mask was now placed in exact register with the outer mask and was then held down on the easel while the outer mask was removed. Finally (f), the outer regions of the print (the money) were then exposed with white light.

Experience will probably show that when using method (A) the local shading of the print should be of a diffuse character; while with method (B), where the utmost sharpness is required between two areas of the

print, contact masks will be found preferable, as in the example.

"Two-Dimensional" Control with Multigrade

Finally, I have here a set of twenty-five contact prints, illustrating the two-dimensional control possible with Multigrade. The prints form five rows of five prints. In each row the colour of the printing light was the same for all five prints, but the exposure was systematically increased from print No. 1 to print No. 5. In each column the contrast has been raised stepwise by a predetermined change in the colour of the printing light. (Actually the change in contrast from each row to the one above is "half a grade," on the scale which I put before this Society a year ago*). It will be agreed, I am sure, that here is indeed two-dimensional control.

In conclusion, I wish to thank all who have assisted me in the preparation of this lecture; and particularly Mr. F. F. Renwick for his constant stimulus in discussion, Mr. Kenneth Gaseltine for certain of the exhibits, Mr. H. Y. Bubbers for the savings stamp subject, and Miss N. Nichols, of my laboratory, for the set, of contact prints.

* L. V. Chilton, *Phot. J.*, 82, 151-159, April, 1942.

THE RECTIFICATION OF PHOTOGRAPHS TAKEN WITH AN INCLINED PLATE

Mr. David Charles, F.R.P.S., writes from 1, St. Leonard's Road, St. Anne's-on-Sea, in reference to the paper under the above title, contributed by Dr. A. Bloch to our last issue:—

"Periodically, since 1901, many detailed mathematical 'solutions' and 'methods' have been published, some in your *Journal*, and most of them emanating from people whose competence in mathematics and whose good faith I could not and would not desire to impugn. Each successive author or supporter of a method whom I approached insisted that the principle was so obviously infallible that no practical proof on his part was called for! During the past twenty years I have spent considerable time and energy in trying out the most promising of the many 'cures,' but in my (not inexperienced) hands not one of them would work. Distortion, often considerable, invariably resulted. Accounts of my researches have been published.

In addition, I have repeatedly asked, pleaded,

challenged, and even offered a reward, for information as to where a demonstration could be seen, or even only for the sight of a single successfully corrected print from an architectural negative taken with a canted camera. Since no such print has ever been forthcoming, it remains an open question whether one exists or even can be made, although to-day to cant the camera is authoritatively advised!

I still contend that the problem of rectifying 'convergent verticals' is not a 'purely mathematical one,' as Dr. A. Bloch and all his predecessors have so invariably claimed. Equally, I continue to maintain that accuracy of mathematical calculation (however crude) is no sounder evidence of the feasibility of this job than is elementary schoolroom arithmetic (however accurate) on the subject of how many men can build a wall.

In view of the consistency with which, for over forty years, with varying complexity, conditions and claims, these formulae have been presented to the photographic public as 'solutions' and as 'methods,' would it not be fair to ask that in future they should either be described as *theories*, or be supported by the evidence of *results*?"

We gave Dr. Bloch an opportunity of seeing Mr. Charles's letter, and have received the following note from him:—

"I fully agree with Mr. Charles's view that 'theories' should be supported by practical evidence in order to make sure that no relevant point has been overlooked. But I am not proposing any new theory, not even a new application of an old one. I merely attempt to explain in simple terms some fundamental principles of the well-established art of photographic surveying. The fact that so few photographers realise that the application of these principles solves this main problem of architectural photography (as well as others) is surely a very good reason for making the attempt.

If Mr. Charles would read the paper, and, in repeating the experiments described in his contribution to the *British Journal of Photography* (1937), would take care of the position of the nodal point of the lens, he would probably himself earn the promised reward.

My colleague, Mr. F. H. Brittain, has made a test similar to that described by Mr. Charles and has secured satisfactory results. I hope to refer to it in a subsequent issue."

ITEMS OF INTEREST FROM VARIOUS QUARTERS

THE LECTURE SYLLABUS

An investigation was recently carried out in America concerning the activities and programmes of photographic societies. Some 1,300 societies were approached, the object being to ascertain the type of programme favoured by the majority of the members.

They were asked twelve questions. We cannot give the complete analysis of the replies, but must content ourselves with the figures which are of principal interest.

The first question was "How often does your club meet?" 40.5 per cent replied that they met twice monthly, 29 per cent monthly, and 23.5 per cent weekly.

The next question, "Are definite meetings devoted only to lectures?" provided the information that 46 per cent did not, and 41 per cent did, arrange definite lecture meetings.

The third question was "Are definite meetings devoted only to print exhibitions?" 45.5 per cent answered "yes," 41.5 per cent "no."

Question Four was "How are programmes for meetings planned?" 42 per cent answered "by programme committees," 34.5 per cent "by a programme chairman," and 13.5 per cent "by a vote of the club members themselves."

Question Five, "Is programme talent provided by club talent?" elicited the information that 48 per cent of the clubs did rely on their members (providing a somewhat ironical comment on the answers to Question Seven), 42 per cent "occasionally," and only 9 per cent not drawing on their own talent.

Question Six was "Do you depend chiefly on outside speakers for programmes?" 53 per cent answered "no," 35 per cent "yes," 12 per cent "occasionally."

Question Seven was "What type of programme is preferred? (a) Lectures by a club member, or (b) Lectures by an outside speaker." 63 per cent preferred the outside speaker, 19.5 per cent expressed no preference, 11.5 per cent voted for the club member talk.

Question Eight, "When prints are hung are they openly analysed?" was answered affirmatively by 85 per cent, 7.5 per cent answered "no," 5 per cent "occasionally."

In answer to Question Nine, "Do you hold annual exhibitions?" 75 per

cent replied "yes," 25 per cent "no." 62 per cent of the clubs also held other exhibitions.

Replies to the three final questions were particularly interesting.

Question Ten: "Do your members prefer technical talks, practical demonstrations, non-technical talks, semi-technical talks?" 13 per cent replied that their members preferred technical talks, 39 per cent practical demonstrations, 5 per cent non-technical talks, and 15.5 per cent semi-technical talks.

Question Eleven, "What subjects seem to be most popular?" resulted in 21 per cent voting for composition, 17.5 per cent for making enlargements, including developing and toning, 11.5 per cent for colour photography, 11.5 per cent for print quality, 11.5 per cent for portraiture, 11 per cent for new processes, and 9 per cent for lighting.

To the final question, "Has your club had difficulty planning and obtaining useful and successful programmes?" 45 per cent answered "yes," 37.5 per cent "no," and 22 per cent "occasionally."

The conclusion of the organisers of the investigation, that the value received from camera club membership depends upon the quality of the club programmes, calls for no comment.

But the moral to be drawn from the investigation (if any moral is to be drawn at all) would appear to be that the vast majority of members of camera clubs are much more interested in results than in the steps taken in obtaining those results. This is only natural; technique is, after all, only the grammar of expression. They join clubs not only to pick up all the information they can concerning technique, but also to associate with those who share a common interest. That interest is, in the majority of cases, not in the technique of picture making, but in the pictures themselves.

The Green Cross Society

For many years past the Green Cross Society, whose general object is "to protect, observe and enjoy open-air Nature," has organised an open photographic competition. The camera is a natural ally in the good work of the Society, and the competition has been one of its most

successful activities. This year the subject is "Wild plants fight on the food front." This subject offers considerable scope to amateur photographers since there are numerous food plants, and the competition should prove popular with them. A little book, "Wild Foods of Britain," published by A. and C. Black, Ltd., describes most, if not all, of the wild food plants, and can be obtained from the Green Cross Society, price 3s. 3d., including postage. Wild food plants mentioned in this book include barberry, mushroom, blackberry, bleint, corn salad, crab apple, fennel, hawthorn, laver, nipplewort, sloe, sorrel, sweet cecily, tansy, watercress, whortleberry, wood sage and wood sorrel, to mention only a few.

The Judges are Mr. F. J. Mortimer, C.B.E., Hon. F.R.P.S., and Dr. J. Ramsbottom, O.B.E., Keeper of Botany, British Museum (Natural History).

The prizes offered are sums of £5 5s. 0d., £3 3s. 0d. and £2 2s. 0d.

Entry forms and all further particulars can be obtained from the Honorary Organiser, Mrs. M. H. Morrison, 41, Asmunds Place, Hampstead Garden Suburb, London, N.W.11. The closing date is December 31st, 1943.

Kinematograph Section

The highly successful meetings arranged by the Kinematograph Section are being continued during the summer, and meetings have already been arranged for May and June.

The meeting on May 15th will be held at the Gaumont British Theatre, Film House, Wardour Street, W.1, at 3 p.m. It is hoped that Mr. Jack Cardiff, A.R.P.S., will be able to give his long-promised lecture on Technicolor production at this meeting. In war time, however, the movements of cameramen are subject to unusual as well as ordinary exigencies, and if Mr. Cardiff should find a further postponement of his lecture unavoidable, members may be sure that the Honorary Secretary, Mr. Stanley Schofield, F.R.P.S., will produce something interesting for them to see on the screen.

An event of much interest has been arranged by the Section for the Mid-summer meeting of the Society on Saturday, June 19th, at 3 p.m. The well-known stage, screen and radio actor and popular member of the Brains Trust, Mr. Leslie Howard, has kindly promised to address the members. It is expected that it will be necessary to hold this meeting outside the Society's House, as it is hardly likely that the meeting room at

Prince's Gate will be large enough to accommodate all who will wish to be present.

Another meeting which will be of interest to members of the Section will be held at the Gaumont British Theatre, at Film House, Wardour Street, W.1, on Saturday, May 1st, at 3 p.m. At this meeting, Mr. T. Thorne Baker, F.Inst.P., F.R.P.S., will lecture on "Forty Years of Colour Evolution," and will show some of the early films in colour.

This meeting has been arranged by the Colour Group, but is open to all members of the Society.

Women and War

An interesting exhibition of photographs, designed to show the tremendous part being played by women in the war effort, has been arranged by Kodak, Ltd., at their Regent Street establishment.

It will remain open daily from 9 a.m. to 5 p.m., Monday to Friday, and 9 a.m. to 12.30 p.m. on Saturday, until April 20th. Admission is free.

The photographs convey an excellent idea of the many types of work now being performed by women, not only in the services, but also in the production of munitions, in land work and in municipal occupations.

Sizes of Photographic Paper

The British Standards Institution has just issued a British Standard for the size of photographic papers, B.S. 1112/1943. This standard is intended to cover the majority of users' requirements; it specifies standard sizes with permissible tolerances, and also gives the raw base weights.

The specification refers to positive paper only, as the standard size of negative and X-ray papers will be the subject of separate British Standards.

Whilst the list covers all the standard sizes, it is not intended to indicate that all photographic papers can be obtained in each size.

Copies of this specification may be obtained from the British Standards Institution, 29, Victoria Street, London, S.W.1. price 6d., post free.

Twickenham P.S.

During the war the Twickenham Photographic Society have organised an interesting series of Exhibitions, "British Isles" Exhibitions of Photography, which have been very successful. The fourth of these exhibitions will be held from Saturday, June 5th, to Saturday, June 19th, 1943, and will be opened by Mr. F. J. Mortimer, C.B.E., Hon. F.R.P.S., F.R.S.A., at 3 p.m., on June 5th.

The Exhibition will be held at the Twickenham Photographic Society's Headquarters, 41, Cambridge Park, Twickenham.

The Judges are Messrs. Percy W. Harris, F.R.P.S., Ronald Procter, F.R.P.S., and G. C. Weston, Hon. F.R.P.S.

The Open Classes are: A, Pictorial; B, Portraiture and Figure Studies; and C, up to whole-plate Prints. Awards of a miniature cup are offered in each class, and eighteen certificates of merit will also be at the disposal of the judges.

The last day for receiving entries is Tuesday, May 4th, 1943.

Entry forms and all further particulars may be obtained from the Hon. Exhibition Secretary, Mr. H. E. G. Ferris, 568, Hanworth Road, Hounslow, Middlesex.

Miniature Camera Group

Circle "F" of the Postal Portfolios of the Group has now been formed, and there are still a few vacancies open. The Hon. Secretary of Circle "F" is: Mr. T. F. Blumfield, A.R.P.S., 90, Alderbrook Rd., Solihull, Birmingham.

SIZES OF PRINTS AND MOUNTS FOR EXHIBITIONS

A Clarification

As we announced in our issue for November, 1942 (p. 387), an Order was made in September last by the Minister of Supply, entitled the Control of Paper (No. 48) Order, 1942. This dealt generally with the great variety of subjects in which paper figures, such as newspapers, posters, circulars, wrappers, greeting cards, etc. It also included photographs.

The part of the Order that specifically referred to photography stipulated *inter alia* that no person in the United Kingdom should produce from sensitised paper any single portrait photograph of a greater size than 56 square inches (i.e., whole-plate size), or group portraits of a greater size than 60 square inches, and that mounts for such photographs should not exceed more than an inch margin at the top and sides or an inch and a half at the bottom.

As a considerable amount of uncertainty has arisen as to the exact interpretation of the Order in regard to work produced for exhibition purposes, the matter has been taken up by The Royal Photographic Society, The Camera Club, and the London Salon of Photography. Joint communications from the secretaries of these organisations to the Ministry of Supply, Paper Control Department, have finally secured a definite pronouncement.

It is now clear that:

(a) The limitation of size of photographic prints applies only to portraits, and that a standard definition of the word "portrait" is, "a likeness," and that any photograph not taken with a view to producing a likeness of the subject would not be regarded as a "portrait."

(b) The limitation of size does not apply to any other subject, i.e., landscapes, architectural subjects, etc.

(c) The size of mounts for photographs is clearly indicated in the Order when the mounting is undertaken by the author of the prints, but prints already mounted before September 14th, 1942, on mounts showing larger margins may be exhibited without alteration.

(d) Exhibition authorities who receive prints unmounted, or prepared in conformity with the Order, may mount such prints temporarily upon their usual stock mounts of larger size, provided that the prints are removed at the close of the exhibition, and the mounts returned to stock for use upon subsequent occasions.

In addition, it was made clear that exhibition authorities would not be held responsible for any infringement of the Order that might be incurred by exhibitors; any point at issue would be between the author of the print and the Ministry of Supply.

We are glad the three leading associations referred to have taken the matter up and arrived at this understanding, which will doubtless prove helpful to the organisers of exhibitions and to exhibitors in all parts of the country.

Moreover, we are convinced that good work is being done by keeping alive and encouraging amateur pictorial photography so far as supplies of materials allow, and we are sure that the conditions indicated above will not be abused, either by exhibition authorities or by the exhibitors themselves.

A PIONEER OF MODERN OPTICAL DESIGN

HAROLD DENNIS TAYLOR

With the death of Harold Dennis Taylor, English optical science loses its most remarkable figure, who saw the change from the older to the newer methods of optical design, in which he was himself a pioneer.

Formerly lens design was largely a combination of experience, empiricism and model making, and English opticians held a deservedly high reputation. The optical opticians were also in the front rank, but there was a fatal gap between the academic and the practical, with the result that the work of Airy, Hamilton and Coddington had no influence on practical design, and their work was largely forgotten, to be re-discovered later by Continental opticians. With the collaboration between Abbe, Zeiss and Schott began a new era, in which optical design was based on calculation, and English opticians began to lag behind the Germans. The importance of this era for photography was that it brought the invention of the anastigmat lens.

Dennis Taylor was at this time optical manager to T. Cooke & Son, of York. His education had been that of an engineer, and he had been responsible for notable improvements in the firm's telescope objectives. When he turned his attention to the design of anastigmats the researches of von Seidel were not available in English, so he went right back to the forgotten work of Coddington, which anticipated much of the German work, but had neither its neatness nor completeness. Taylor had, therefore, largely to build up his own system of optics. The result was an entirely original design. The Germans had evolved the anastigmat by a step-by-step process from the periscope of Wollaston

and the rapid rectilinear of Dallmeyer and Steinheil. Dennis Taylor broke away from tradition. He saw that flatness of field could be achieved by the combination of a dispersive lens of low refractive index with a collective lens of high refractive index, both of which glasses had become available; distortion required the division of the collective lens into two. Thus resulted the triplet of three simple separated lenses. Contrast this with the German type, of lower aperture, containing six, eight, or even ten components. The brilliance of the Englishman's conception is borne out by the fact that it is the basis of practically every photographic lens design of to-day, while the German type is largely obsolete.

Other patents testify to the continued fertility of the inventor's brain, yet it cannot be said that Dennis Taylor received the recognition that his great originality deserved, and it was not till thirty years after his invention of the triplet that any honour was paid to him. Then, in 1923, he received the Traill Taylor medal. In the memorial lecture he dealt first with the problem of projection from a continuously moving film, and then startled his audience with a discussion on the possibility of photographing ghosts and fairies. He received the Duddell medal from the Physical Society in 1934, and the Progress medal of The Royal Photographic Society in 1935.

The manufacture of his anastigmats was entrusted to the firm of Taylor, Taylor & Hobson (Dennis Taylor was not related to any of the other Taylors mentioned in this

notice), and they were called "Cooke" lenses from his own firm. When he retired he was engaged as consultant with Messrs. Taylor, Taylor & Hobson, Ltd., and wrote one or two papers dealing with the errors of the rotating parallel plate image stabiliser with continuously moving film. But Dennis Taylor was not a prolific writer, and wrote little besides his *System of Applied Optics* (1906).

It is of interest to note that Dennis Taylor foresaw the advantage of artificially treating glass surfaces to reduce surface reflections, a process which has now come into use and is likely to be of great importance in the future. In another direction he may also prove to be a prophet—in the design of flat field telescopes and microscopes.

It is probably owing to his modest and retiring nature that Dennis Taylor did not receive more honours. Of his methods of design, some glimpses were given to the Optical Society in a paper on *Optical Designing as an Art*, of which the title alone is sufficiently suggestive. It has been stated that if a million monkeys pounded as many typewriters for a million years they must inevitably, by the laws of chance, produce all the books in the British Museum. Something of the same idea underlies the methods of the German firms who set a score of "computers" grinding on calculating machines and await the result. And has it not been revealed only recently that Petzval receive the aid of a number of artillerymen, "skilled in the calculation of ballistics," to help him in his optical computations? Not by such means was the Cooke lens invented.

H. W. LEE.

JOHN WHITE

President of The Photographic Alliance

It is with much regret that we have to record the death of Mr. John White, the President of The Photographic Alliance.

He had been ailing for some time, but was hopeful that warmer weather would restore him to normal health. His death occurred quite suddenly on March 23rd.

Mr. White succeeded Mr. W. E. Gundill, O.B.E., J.P., F.R.P.S., in the Presidency of The Photographic Alliance last year, and his election to the office marked the appreciation of his colleagues of the excellent services which

he had rendered to the Alliance during his fifteen years' association with it.

As a delegate of the Lancashire and Cheshire Photographic Union, he took a useful part in the discussions which led to its formation, and since then had served continuously on the Executive Committee. He was a staunch upholder of the Alliance, and always an outspoken and friendly counsellor. There is no doubt that he would have been elected to a second term of office had he survived, and his death leaves a blank which will not easily be filled.

By profession a schoolmaster, Mr. White retired a few years ago. He was very proud to number among his pupils one who later achieved world-wide fame as an actress and singer—Miss Gracie Fields.

Cheery always, friendly and optimistic, he will be greatly missed by his friends and colleagues.

He was a member of the Manchester Amateur Photographic Society, and joined The Royal Photographic Society in 1931.

S. · P R O C E E D I N G S U N C I L M E E T I N G

MEETING of the Council of The Royal Photographic Society was at 16, Prince's Gate, S.W.7, on 8th March, 1943, when the following were present: The President, Mr. D. McMaster, in the chair. H. Baines, A. J. Bull, A. J. Catford, J. A. Coote, A. E. Cy W. Harris, G. E. W. Herbert, T. Midgley Illingworth, Johnston, R. H. Lawton, F. J. Mortimer, Arthur S. Newman, Pike, J. H. Pledge, Thomas H. B. Scott, F. J. Tritton, C. I. G. C. Weston.

Members

Following Candidates were for Membership:—

George Andrews, 115, Cambridge Road, Teddington, Middlesex.

Eric Askin, 56, Digby Apperley, Nottingham. Frederick Bennelick, Mess M.S. *Mauritius*, c/o London.

Berriman, c/o Messrs. Ltd., The Works, one, Harrow. (Member, Works Photographic Society).

at, M.Sc., Ph.D. (Pro-St. Xavier's College, N.I., India. (Member, Art Group, Bombay). Harold Billington, 12, Lane, Worsley, near Manchester.

ger, 22, Old Farm Road, by, Liverpool 22. (Member, Liverpool Amateur Photographic Society).

ston Bowman, "Turn-Hindhead, Surrey.

vn, 350, Padliham Road, (Member, Manchester Photographic Society).

Augustus Budd, 134, Street, Rochdale, Lancs.

ncey Burrow, A.I.B.P., Street, Ilfracombe.

ssle Butler, Larkfield, nury, near Basingstoke.

Byrne, 323, Main Street, Canada. (Member, Camera Club).

aghan, 36, West Street, n, Worcs.

Alexander Wright Cuth-

25, High Street, Pen-

sidlothian. (Member, Photographic Soc-

Moncrieff Davidson,

louse, Sutton Courtney,

n, Berks.

as Deane (Corporal),

aphic Section R.A.F.,

al Museum and Art

Stranmillis, Belfast,

n Ireland.

Hal de Sylva, Ph.D. 3, c., Utility Squadron One, c/o Fleet P.O., San Francisco, Calif. c/o Photo Lab.

Eric D. Dickson, Eristoun, Worplesdon Hill, Woking.

John Edenbrow, 12, Eyres Terrace, Armley, Leeds 12. (Member, Armley and Wortley Photographic Society).

Herbert Charles Ellis, 13, Ravenslea Road, Wandsworth Common, S.W.12.

W. H. Freegard, 8, Piccadilly Mansions, Oxford Road, Rosebank, Johannesburg, S. Africa. (Member, Johannesburg Photographic Society and Camera Club).

Aubrey Roy Jack Frost, 25, Severn Road, Ipswich, Suffolk, (Member, Ipswich and District Photographic Society).

Archibald Smart Harvey, 508, Welford Road, Leicester. (Member, Leicester and Leicestershire Photographic Society).

William Hawkins, 44, Park Grove, Battersea, S.W.11. (Member, John Ruskin Camera Club).

Stuart Conan Hayward, 10, Blawith Road, Harrow, Middlesex. (Member, Kodak Works Photographic Society).

William Nisbet Henderson, 45, Denholm Street, Greenock, Renfrewshire. (Member, Greenock Camera Club).

James Henry Hill, 18, St Oswald Avenue, Pontefract, Yorks. (Member, Pontefract Photographic Society).

Fred Holme, 2, Porlock Road, Flixton, Lancs.

James Barlow Hurst, 16, Belvedere Road, Darlington, (Member, Darlington Camera Club).

Herbert Robertson Husband, 64, Armley Grange Avenue, Leeds 12.

Sydney Herbert Hilton James, B.Sc., "Denford," Woodley, Reading. (Member, Windlesham Camera Club).

Arthur Sydney Johnson, 1, Broadway, Leigh-on-Sea.

John Henry Johnson, 20, Mainridge Road, Chislehurst, Kent. Hans Kaden, 409, Newbold Road, Jenkintown, Penna., U.S.A. (Member, The Camera Club of New York).

F/Lt. Czeslaw Kierzkowski, c/o BCM/MONO, W.C.1.

Felix P. Knight, c/o the Rev. J. E. Knight, Greenbay, Moravian Manse, Antigua, B.W.I.

Edward John Lambert, 28, Keppel Road, Chorlton-cum-Hardy, Manchester 21. (Member, Manchester Amateur Photographic Society).

Thomas Archer Langley, 222, Court Lane, Erdington, Birmingham 23. (Member, The Gloucester Postal Photographic Society).

Alonzo Ronald Lucas, Post Office Flat, Bridgend, S. Wales. (Member, Bridgend Camera Club).

Stanley Ernest Manson, 66, The Manor Drive, Worcester Park, Surrey. (Member, John Ruskin Camera Club).

Frederick Hassold Maura, Nassau N.P., Bahamas, B.W.I.

John Stephens Orr, 242, Langlands Road, Glasgow, S.W.1. (Member, Glasgow and West of Scotland Photographic Society).

Philip Paneth (Dr.), 25, Tarranbrae, Willesden Lane, N.W.6.

S. G. Pansare, 164/B "Casa Urbina", Annex, Vincent Road, Dadar Bombay 14, India.

Ronnie Pilgrim, Flying Officer, R.A.F., R.A.F. Film Production Unit, Iver Heath.

Cyril Francis Pine, 1, Escolme Drive, Greasby, Upton, Wirral, Cheshire.

Aligohar Qureshi, 307, Cincinnati Town, Karachi (Saddar). (The Camera Art Group, Bombay).

Bernard Jack Rastall, B.Sc., 28, Parkwood, Oakleigh Road, Whetstone, N.20. (Member, Southgate Photographic Society).

S. H. H. Razavi, c/o U.P. Amateur Photographic Association, 10, Cantonment Road, Lucknow, India.

Dharmendra Sarawal, 321D, Vincent Road, North Bombay 19, India.

A. Schonfeld, 29, Oakland Drive, Prestwich, near Manchester. (Member, Manchester Amateur Photographic Society).

Lindley Searle, *The Morris Owner and Nuffield Mail*, Cowley, Oxford.

Charles A. Silver, "Greenwoods," Pinner Green, Middlesex.

Charles Frederic Simcock, "Els Wick," Pike Hill, Burnley, Lancs.

C. F. F. Snow, The School House, Braywood, Windsor. (Member, Windlesham C.C.).

Philip Wilfrid Thomas, 39, Elm-bank Crescent, Glasgow, C2.

Stanley William Towers, Messrs. Ilford, Limited, St. Albans Road, Watford, Herts.

Benjamin Barstow Twivy, 54, Hollyshaw Lane, Whittkirk, Leeds, Yorks. (Member, Leeds Camera Club).

Rhys Ceirlog Williams, M.P.S., Oak Pharmacy, Llanrwst.

John Harrah Wood, 5950, Drexel Road, Overbrook, Philadelphia, Pa., U.S.A.

Lilian Whitaker (Mrs.), "Two Trees," 2, Marina Drive, Rosehill, Marple. (Member, Manchester A.P.S. and Stockport P.S.).

Maurice Philip Wooller, The Ramblers, Marleycombe Road, Camelsdale, Haslemere, Surrey.

JUNIOR MEMBERSHIP

Hatty Aldridge, 67, Barber Road, Sheffield 10. (Member, Sheffield Photographic Society).

Ronald Ernest Carswood, 175, The Ridgeway, North Harrow, Middlesex.

Heinz Gotthelf, 316, Coombe Lane, London, S.W.20. (Temp. 74 Coy. P.C., c/o G.P.O., Swanage, Dorset).

William Arthur Jones, 16, Berkshire Street, Derby.

Fred Stanton, 28, Peewit Road, Hampton, Evesham, Worcs.

Cecil Alan Stephens, 15, St. Pauls Avenue, Kenton, Harrow. (Member, Kodak Works Photographic Society).

Joan Stimson (Miss), 7, Audley Road, Hendon, N.W.4.

Kenneth Eardley Willmott, 85, Wathen Road, Leamington Spa, Warwickshire.

The Candidates who were nominated at the February Meeting of the Council (see p. 94, March issue, *this Journal*), were elected to Membership.

Resignations

W. Buston, of Norwich, Norfolk. (On account of ill-health).

N. K. Dutt, of Calcutta, India.

Obituary

The Council much regretted to learn the loss of the following:— (Missing, presumed killed). Lt.-Comdr. R. St. Burston, R.N., of London.

Charles Bowren, of Vancouver, B.C., Canada.

S. A. Devey, of London.

F. H. Dennis-Taylor, Traill Taylor Memorial Lecturer, 1923, and Progress Medallist, 1935.
W. H. Zerbe, of New York, U.S.A.

Pirie MacDonald Bequest

It was reported that this bequest of 5,000 dollars had now been received, and had realised through the Exchange Control the sum of £1,236 2s. 10d.

The late Mr. Travis Burton

A letter was received from Mr. Oscar Burton in which he informed the Council that it was the wish of his father, the late Mr. Travis Burton (Fellow), to present to the Society his two lectures, "Ten Great English Cathedrals," and "English Cathedrals, Second Series," and enquiring whether the Council would wish to accept them. It was resolved that Mr. Burton be informed that the Council would be very happy indeed to accept the lectures for preservation in the Permanent Collection.

Re-instatement in the Associateship

It was resolved that Mr. F. A. Harding be re-instated in the Associateship upon rejoining the Society.

This being the last meeting of the Members of the present Council the President thanked those retiring for their services to the Society during their term of office, and all the Members for their unflinching support of the Chair during his year of office, which he had greatly appreciated.

Wastell Memorial Trophy

It was resolved that a donation of £10 10s. 0d. be contributed to the Fund opened by the Central Association of Photographic Societies with the object of instituting a Trophy to be offered for competition annually, and to be known as the Wastell Memorial Trophy.

Gift

The Council accepted the following gift with much appreciation: A copy of "Photography in Colours," by R. Child Bayley; a copy of "The Appeal of the Picture," by F. C. Tilney, for the Library, from Mr. R. H. Lawton, Hon. F.R.P.S.

ANNUAL GENERAL MEETING

The Annual General Meeting of the Fellows, Associates and Members of The Royal Photographic Society, was held at 16, Prince's Gate, S.W.7, on March 9th, 1943. The President, Mr. D. McMaster, F.R.P.S., was in the Chair.

The Report of the Council for (Continued in last column).

ANNOUNCEMENTS

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2 2s. 0d.; Group subscriptions, which became due for renewal on the same day, are as follows: Scientific and Technical Group, 7s. 6d.; Pictorial Group, 5s.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s.; Kinematograph Section, 5s.

Group subscriptions may be included with the Annual Subscription, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscriptions to the Society through their own Bank to The National City Bank of New York in New York, or direct to The National City Bank of New York. Such subscriptions should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square Branch, London, account. Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to ask them to mention their names, addresses and status (Fellow, Associate, Member); and Members making the remittance direct to The National City Bank of New York are requested to give this information.

It is important to note that payment should be made "For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the same time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

LECTURE SESSION

The following meetings will be held at 16, Prince's Gate, S.W.7, unless otherwise stated.

Saturday, April 17th, 3 p.m., at the Gaumont-British Theatre, Film House, Wardour Street, W.1. Meeting arranged by the Kinematograph Section. Cinematography in War Time. No. 5. "The Development of Kinematography in the Army" By Capt. E. Stuart, R.A.O.C.

Saturday, April 24th. Easter. No Meeting.

Saturday, May 1st, 3 p.m., at the Gaumont-British Theatre Film House, Wardour Street, W.1. Meeting arranged by the Colour Group. "Forty Years of Colour Revolution." By T. Thorne Baker, F.Inst.P., F.R.P.S.

Saturday, May 15th, 3 p.m. Projection of Slides accepted for the Central Association Exhibition.

Saturday, May 15th, 3 p.m. Meeting arranged by the Kinematograph Section, at the Gaumont-British Theatre, Film House, Wardour Street, W.1.

Tuesday, May 25th, 6 p.m.

"Photography in the Drawing Office." By F. J. Tritton, B.Sc., F.I.C., F.R.P.S.

Saturday, June 12th, 3 p.m. Meeting to be arranged by the Miniature Camera Group.

Saturday, June 19th, 3 p.m. Midsummer Meeting arranged by the Kinematograph Section. Address by Leslie Howard.

Saturday, July 17th, 3 p.m. Meeting to be arranged by the Miniature Camera Group.

EXHIBITIONS AT 16, PRINCE'S GATE

April. (1) Prints by Overseas Readers of *The Amateur Photographer*. (2) Natural History Prints by Captain G. K. Yeates, F.R.P.S.

May. Central Association Exhibition.

June. (1) Pictorial Group Annual Exhibition. (2) Spanish Cathedrals and Churches. By J. R. H. Weaver, M.A., Principal, Trinity College, Oxford.

the year 1942, and the Income and Expenditure Account and Balance Sheet were adopted by the Meeting.

The Chairman of the Scrutineers of the ballot for Officers and Council, Mr. P. J. Mullett, declared the result to be as follows:—

President: D. McMaster (Fellow), *Unopposed*.

Vice-Presidents: H. Baines (Fellow), 287 votes; F. J. Tritton, (Fellow), 244 votes.

Honorary Treasurer: R. H. Lawton (Hon. Fellow), *Unopposed*.

Ordinary Members of Council:
A. J. Bull (Hon. Fellow), 333 votes;
J. H. Coote (Fellow), 302 votes;
A. E. Dent (Fellow), 223 votes;
Percy W. Harris (Fellow), 385 votes; G. E. W. Herbert (Fellow), 270 votes; T. Midgley Illingworth (Member), 328 votes; J. Dudley Johnston (Hon. Fellow), 378 votes; H. Bedford Lemere (Hon. Fellow), 161 votes; Rosalind Maingot (Fellow), 210 votes; Arthur S. Newman (Hon. Fellow), 351 votes; J. H. Pledge (Fellow), 252 votes; Ronald Procter (Fellow), 148 votes; S. Schofield (Fellow), 239 votes; Hugo van Wadenoyen (Fellow), 180 votes; G. C. Weston (Fellow), 302 votes.

The proceedings, a full report of which will appear in our next issue, concluded with the re-election of Messrs. Calder-Marshall, Ibbotson and Bound as Honorary Auditors for the ensuing year.

NEW PREMISES' SPECIAL FUND

The following donations are gratefully acknowledged:—

Amount previously acknowledged ...	£	s.	d.
J. Cameron, Esq. (3rd donation) ...	10	6	
E. G. C. (5th donation) ...	1	1	0
A. Coleman, Esq. (4th donation) ...	1	1	0
G. Douglas, Esq. (8th donation) ...	10	6	
F. Epstean, Esq. (5th donation) ...	1	0	0
G. A. Forman, Esq. (2nd donation) ...	2	2	0
D. H. J. Hardy, Esq. ...	1	0	6
J. MacPherson, Esq. (6th donation) ...	1	1	0
E. H. E. Pixey, Esq. ...	2	2	0
C. G. Rhodes, Esq. ...	1	1	0
Basil Shackleton, Esq. ...	3	3	0
R. B. Willcock, Esq. (2nd donation) ...	10	6	
	£1128	17	3

THE PHOTOGRAPHIC JOURNAL

OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND
THE PHOTOGRAPHIC ALLIANCE

HONORARY ADVISORY EDITORS.—*Scientific and Technical Section*: C. WALLER, M.Sc., A.I.C., F.R.P.S.
Art Section: J. DUDLEY JOHNSTON, HON. F.R.P.S. *Kinematograph Section*: ARTHUR S. NEWMAN, HON. F.R.P.S.
EDITOR: H. H. BLACKLOCK, F.C.I.S., F.R.P.S.

VOLUME
XIII

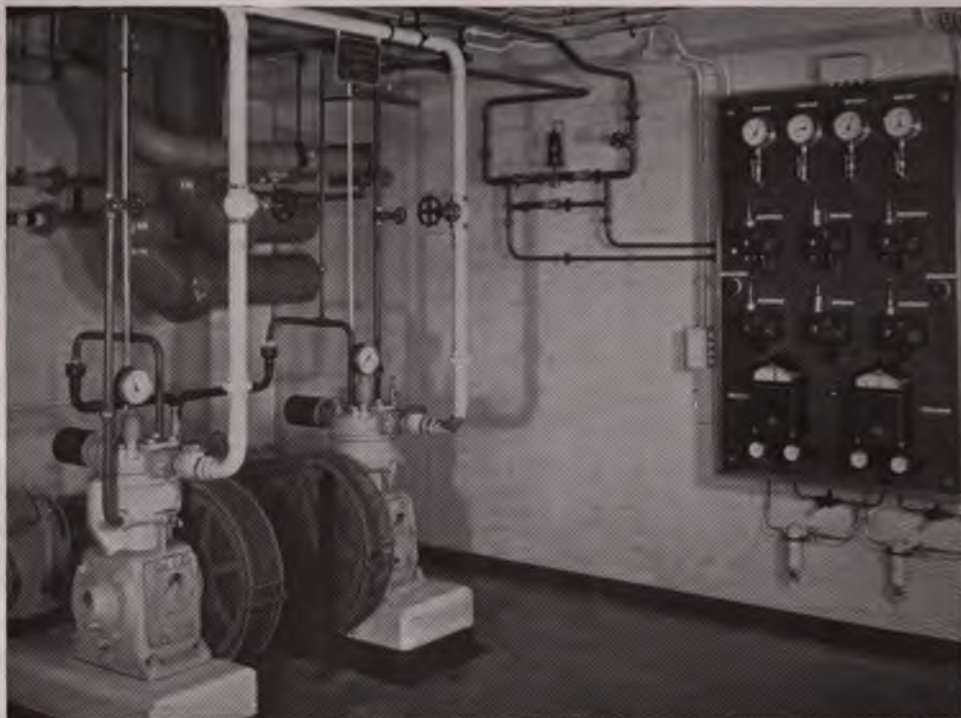
MAY, 1943

TWO SHILLINGS
AND SIXPENCE



DONALD McMASTER, F.R.P.S., President, Royal Photographic Society

Portrait by The Hon. M. W. Elphinstone, F.R.P.S.



Control Equipment

THE PRESIDENTIAL ADDRESS

The President, Mr. D. McMaster, F.R.P.S., delivered his Presidential Address on December 12th, 1942, at the Society's House, 16, Prince's Gate, S.W.7, on "The Rôle of the Photographic Manufacturer." Mr. F. J. Mortimer, C.B.E., Hon. F.R.P.S., Past President, occupied the chair.

The CHAIRMAN said that less than a year ago he gave a Presidential Address, Mr. McMaster being in the chair; this year the positions were reversed. At the end of his own address he said that all the official bodies and Ministries with which he had been in touch in securing data had frankly admitted the great debt they owed, not only to Photography, but to photographic manufacturers, for the continuous progress which had taken place in apparatus, equipment, methods and material. The tremendous demands made upon this specialised industry were not generally realised, and the contribution made to the war effort reflected great credit on those concerned. Mr. McMaster was taking up the story where he himself had left off.

There was no one more able or competent to give such an address with the voice of authority than Mr. McMaster; no one knew more about photographic manufacturers or photographic manufacturing.

THE RÔLE OF THE PHOTOGRAPHIC MANUFACTURER

By D. McMaster, F.R.P.S.

I COME to you to-day as a representative of a down-trodden and subdued minority in the photographic world, as a spokesman for a group ever willing to spend huge sums of money to advertise its products, but seldom articulate on its peculiar and, at times, almost overwhelming problems. I am a manufacturer of materials for the photographic and allied trades. The enthusiastic amateurs have clubs, societies and associations of all sorts to present their stories. For the large

body of unattached users of our products the Board of Trade and similar institutions act as sponsors. The professional photographers are excellently represented by the Institute of British Photographers. The technicians of the cinematographic trade and of roentgenology are similarly served. But no one—except themselves—holds a brief for the much abused manufacturers. It is my hope that for a short time I can interest you in some of the worrying and interesting problems which are



Inside a Modern Factory

ways with us, but which have become increasingly burdensome as the war years have gone by.

From time to time it has been a pleasant task for me to show visitors around a large factory, concerned with the manufacture of goods used in the photographic trade. These visitors have been from all walks of life, from the most erudite savants to the equally interested, but less well qualified, rank and file enthusiasts. Without exception these visitors, who could, obviously, see only a fraction of the critical processes involved, have been astonished at the intricacies of the work, at the special

precautions and controls which have to be maintained, and at the meticulous selection which has to be made of the raw materials. Those of us engaged in the industry do not feel that we are vain when we claim that we have baffling and unique problems such as few industries have — problems calling for unusual standards of education on the part of executives and workers, and necessitating the establishment of first-class staffs of research and technical people.

Generally speaking, the structure of all large companies is somewhat similar, and no doubt every person in this



Weather Bureau

room is entirely familiar with this structure. However, at the risk of boring you, I should like to indicate here the type of set-up which is generally followed. In the first place, we have the owners of the business, usually the general public, in the form of shareholders. To these shareholders each officer of the company, from the president down, is obligated in every sense of the word. The shareholders, often employees of the company, have every right to expect that management and control will be such that the goods turned out are of the best possible quality, that they are manufactured and sold at a price which yields an adequate profit. The businesses are almost invariably controlled by Boards of Directors, and under these boards of directors relate the various divisions of the company corporate.

Because it is most easily disposed of, and is of least interest to the meeting this afternoon, I mention first the general management and official control of the company. Usually the secretary of the company heads up the general accounting, the office management and other such ancillary staff service groups. Particularly during war-time a great burden has been put upon these staffs, partly because of the increased measures of taxation which have been levied, and partly because of the multifold Government decrees having to do with quotas and limitations of all sorts. Most of the members of these ancillary staffs should have had some experience of the sales and distribution and production sides of the business, in order fully to understand their present functions. The wise company head sees to it that there is a constant flow of manpower between these secretarial groups and the sales and production groups.

A second important group of any company is that having to do with sales and distribution. Under this group head often comes the advertising department—in our particular field of endeavour, a most important

department. Here again it has been found necessary that if the utmost in the way of service is to be given to the customer by the sales, distribution and advertising departments, a thorough knowledge of the materials being manufactured and, indeed, some knowledge of the actual manufacture, is imperative.

A third group, and perhaps the one we are most interested in this afternoon, is that controlling the actual manufacture. Under the production or manufacturing head are usually grouped the technical and research staffs, purchasing department, and, sometimes, the service unit.

Ancillary to all of the groups I have mentioned, but connected often as an independent group in order not to limit its activities, comes a patents and trade-mark department, which has to be staffed with a thoroughly knowledgeable personnel. Members of this department must, in addition to being masters of patent law and of photographic procedure, have a working knowledge of one of the various branches of the sciences—chemistry, physics, mathematics or engineering. It is not often understood by the users of photographic materials just how important a unit this patent department is.

In the case of the sales and distribution groups, it is necessary that the members, nowadays at least, should have a high technical knowledge. More and more sales of photographic materials have to do with products to be used in the fields of commercial photography, of X-ray and of cinematography. In these divisions it is essential that the sales representatives should not only be aware of the characteristics and capabilities of the materials manufactured by their own firm, but they must have a first-class *working* knowledge of competitive materials in their particular fields. Preferably they should have spent, at some period in their career, considerable time in a manufacturing unit, or in research laboratories. The old-time traveller with an affable manner,



Employees' Dining Room

with no technical knowledge behind him, is gone ever.

Similarly, in the distribution of the goods, it is necessary that the wholesale and retail salesmen have a thorough knowledge of the products. Nothing is so galling to a customer than to approach a sales representative, expecting to receive information and advice, and to find that the salesman is lacking in the necessary knowledge apart from that advice.

With advertising, it has to be borne in mind that photographic materials made by a particular manufacturer must not only compete with the goods sold by competing manufacturers, but that they must also go out to the public in full competition with myriads of similarly advertised goods. Assuming, for instance, that the purchasing public has so much money to spend on its hobbies, pleasures, its recreations, photography as a whole must be emphasised in the advertising, in order to divert a reasonable share of that spending money towards photography. To this end, it is customary to have a considerable amount of the advertising of a general nature, calling attention to the allure of photography as a desirable hobby and only incidentally referring to the products of the individual firm advertising. In addition to this, of course, the advertising firm has every right to advertise the products which that particular firm believes to be pre-eminent in the field, or, what is perhaps just as true, products which they would like the public to have as pre-eminent. My experience of the products which are advertised by the photographic trade in Great

Britain leads me to believe that the advertising is fundamentally honest.

Advertising, of course, fulfils another function. It is necessary to call to the attention of engineers, X-ray workers, to specialists in all professions, products which are best suited for their use. In this manner advertising performs a real service and we have reason to know that it is greatly appreciated by those concerned.

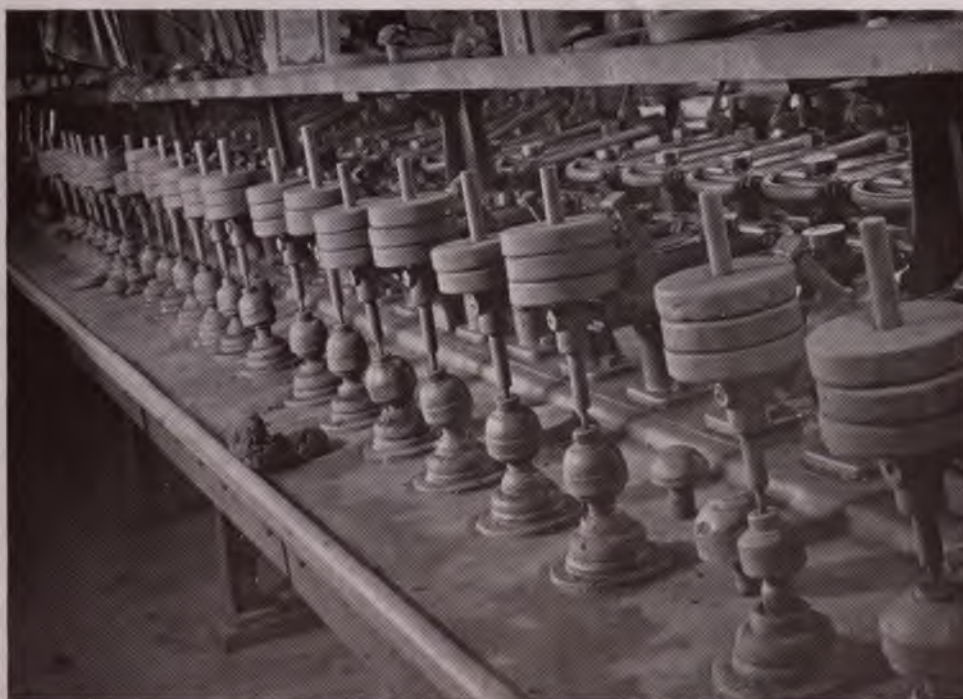
It is one of the major functions of the sales, distribution and advertising personnel, to impress upon those who are using photographic materials the fact that sensitised goods, in particular, are perishable articles, that they are subject to deterioration under unusual conditions. More than ever now, when manufacturers are using substitute materials, it is necessary to point out to customers of all types the dangers attendant on unusual moisture, heat, stress or light. This is particularly true of the firms which have international representation, and the products have to be distributed for storage and use in tropical and sub-tropical climates.

A large part of the advertising service has to do with the issuing of booklets of instruction—booklets which are not in themselves concerned with advertising the products of an individual firm, but which are teaching operators correct methods of using all photographic materials. Almost without exception it will pay the user to follow implicitly the recommendations of the individual manufacturers when using the products of those manufacturers. Much testing and experimentation has gone on before the instructions are drawn up and their

*Plate Examination**Plate Packing*



Shutter Repairs



Lens Grinding

issuance is a service well worth taking advantage of.

It is in production of goods, however, that we, as photographic manufacturers, differ most from manufacturers of other materials. It is easy for you to understand that the personnel engaged in the manufacture of sensitised goods must be most carefully chosen. Since a great deal of the operations connected with photographic manufacture are carried on in illumination of a low order, it is necessary that the employees have good eyesight and are not colour blind. For the same reason, these employees must be entirely trustworthy, because it is difficult in the extreme for supervision to exercise the same control over the workers in darkrooms as it is in daylight. Workers who have spent some time in these darkrooms acquire an extra sense, and there is no question whatsoever that such delicate products as X-ray film, aero film, to mention two of many, have to be handled by people who are thoroughly experienced. To secure the proper type of personnel, every good-sized photographic manufacturer maintains a corps of personnel workers charged with the responsibility of selecting and maintaining a body of employees adequate to perform unusual tasks. What may not be so easy to understand is that well-equipped medical departments, where employees may have the benefits of consultation with doctors, nurses and oculists, is a first-rate investment for the manufacturers, and that routine physical examinations are part of these medical units.

The raw materials for the manufacture of sensitised goods are selected after long testing, and the quality is maintained by constant control. I have only to mention to you film base and raw paper stock, for you to sense the problems with which we are faced. But these raw materials, important as they are, are not greater than the task of finding the proper gelatines, the ideal chemicals

for balancing the emulsions, or the materials, in which the final manufactured goods are to be wrapped for stock.

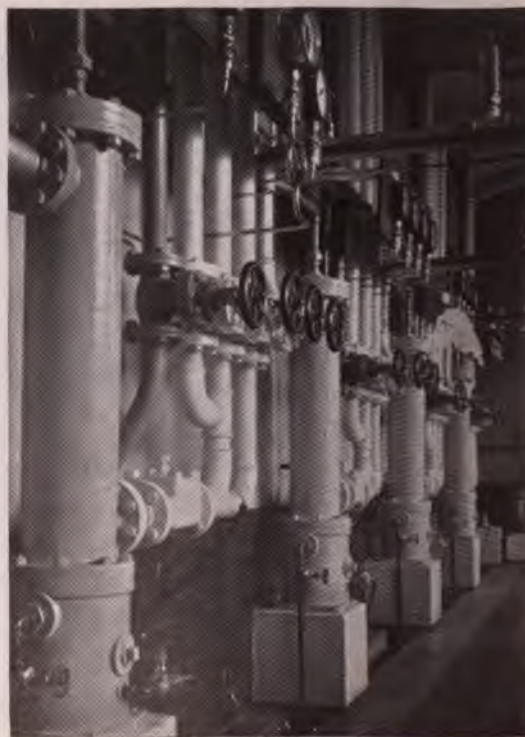
You have had several papers over the years on the manufacture of raw film base, and I do not propose, in the short time at my disposal, to discuss the problems which we have to face up to. It is enough for me to explain to you that the base must be made in lengths thousands of feet long without any break in its qualities, that it must receive a sub-stratum which will enable the gelatine-bodied emulsion to adhere to the base after coating and drying, that there must be a high degree of compatability between the vari-grade emulsions and the solvents and plasticisers used in the base and with the chemicals used in the sub-strata. To pass over this question in these few sentences, as I have, is to pay scant justice to the tremendous amount of work which has been carried on in the past to secure this compatability, and to the extreme degree of control necessary to maintain this compatability. Nothing in the whole manufacture of photographic materials is more delicate, not even the manufacture of the special emulsions.

So, too, in the case of paper base. As you well know, a specially selected and specially sized paper must be used. This is rendered even more inert to the silver emulsions by the coating of barium sulphate, sometimes in multiple layers, to act as a buffer on the surface of the paper. The exact nature of the deposition of the baryta coating also, of course, provides the base for the final surface to be achieved. The utmost care has to be exercised in the selection of a suitable base and in the coating of it to the baryta coating, even before the emulsions can be introduced to it.

I have not mentioned, in the case of either film or paper base, the question of physical characteristics. These, you may take it, have well-defined limits for



The New-type Worker



Refrigeration Machine

y, plasticity, flexibility, etc., before either film or bases can be considered usable.

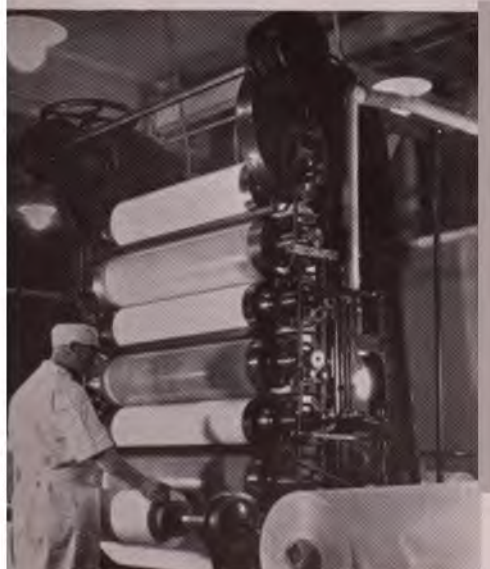
the manufacture of photographic chemicals, an nely high order of purity is necessary. In the old when there were one or two well-recognised and standard developers on the market, such meti-are was not so necessary, but to-day, when the p-ers and the fixing baths, the restrainers and rs, have all been matched to the particular products re to be used with, chemicals of the highest degree ity only may be put into the final product. The naking photographic chemicals have never received edit due to them, but this is an important phase of graphic manufacture, and it will become more tant in the future, when better and more specific p-ers are brought to the attention of the photo-ic public.

the manufacture of cameras and of photographic atus, the selection of the raw materials is a major m. In addition to ensuring that none of the ials in the equipment is such as to reduce or itise the sensitised films or papers used in the nent, stringent physical requirements have to be It is insufficient to assume that cameras, enlargers, ping units, etc., will be adequate to the conditions ed upon them in this country, but it is necessary sider the raw materials in the light of tropical or opical use. Stainless steel, fine alloys of magne- or aluminium, special types of brass, artificial r, cardboard, inert glues, etc., all enter into the acture. In the case of cameras and enlargers, of , there is the problem of the optics involved, and he subject is so involved that it is not possible for do more than mention some of the problems. It r cry from the old days of the single meniscus lens.

We now find ourselves confronted with the problems of utilising the knowledge we possess of high refractive index glasses, of light depositions on lens elements to eliminate flare and reflection. We have the question of the use of aspherical lenses and, in the cheaper optical goods, the possibility of moulded lenses. I can only indicate to you that we have many trained scientists and engineers constantly at work on these matters, and that, without question, much will evolve.

During war-time conditions it has, of course, been necessary for us to experiment with many substitute materials for camera and apparatus manufacture, and a good deal of progress has been made in the use of plastics. It seems possible that in post-war years, when a great expansion in the manufacture of apparatus for photographic use is indicated, that more and more use will be made of such substitutes. Many of them now used have undoubtedly come to stay, and the research work which is being done by many companies on other materials will be utilised to the full.

There is an embarrassment of riches when I come to speak of the special manufacturing equipment which has had to be devised for the manufacture of sensitised goods. The deposition of layers of emulsion fractions of thousands of an inch in thickness on to a web of paper or of film base is no easy task. When it becomes necessary, as it increasingly is, to put a multiple number of coatings successively one upon another and to maintain an even thickness laterally and longitudinally, the problem becomes critical. It is not possible for me to do more than indicate the technical problems involved here, since much of the apparatus is of an extremely secret nature, but you can figure some of them out for yourself. Bear in mind that this thickness of deposition must be uniform throughout thousands of feet of coating, and that the



(Left) Paper Calender

(Right) Paper Drying Tracks



Baryta Mixer

slightest variation in thickness will cause complications which cannot be taken care of by the user.

Perhaps in few industries have air conditioning, science, and skilled technique, been so thoroughly harnessed as in photographic manufacture. In order, effectively, to dry and "cure" emulsion-coated film, it is necessary to have exact and precise atmospheres and to vary those as the drying is carried on. Controls are to within a degree or so of temperature and to within a percentage or two of relative humidity. Each film product has, in the end, to be handled in an atmosphere which will permit it to retain that portion of moisture best suited to its keeping and its ultimate use. Temperatures and humidities are evenly maintained by having available sufficient refrigeration to establish low dew points, and then by bringing the temperatures up to the required extent. Factories manufacturing photographic goods have some of the most extensive ice-making machines of any industry, and the ice-making capacity of a major-sized factory will equal that of a good-sized town.

Coupled with the control of the relative humidity and temperature of the atmosphere, there goes the necessity for absolute cleanliness. Standards of cleanliness, which would pass in any recognised food factory, would be wholly inadequate to satisfy the requirements of a film factory. The utmost care is exercised in filtering out not only the finely-divided particles of foreign materials, but in seeing to it that no dirt particles are carried into the manufacturing rooms on the persons of the operators or in any of the clothing. Specially designed overalls are part of the manufacturing technique, and close examination is paid to the physical characteristics of each operator. To the layman such precautions seem absurd, but you may take it that they are highly necessary.

In the slitting and cutting of such products as X-ray, the mechanisms have to be so designed as to permit no abrasion, no turning or bending of the product. When it is realised that each individual sheet of X-ray film is handled many times by machinery and is inspected front and back by competently trained examiners, you will see something of our problems.

Every large photographic manufacturing company maintains a big staff of trained engineers, whose sole duty is to design, manufacture, and maintain the highly-specialised and complicated machinery which the product demands. Virtually every known trade is represented in the engineering staffs of the various factories, and the controlling engineers are those with the highest educational qualifications. Because of the secret nature of the equipment, and because there are few industries involved, it is difficult for the photographic manufacturer to go outside for advice. Almost all of his equipment has to be designed by his own staff.

One of the biggest operations in the field of manufacture has to do with the testing or inspection of the products. One must bear in mind that the products are, in so far as sensitised goods are concerned, manufactured in subdued light, sometimes in total darkness. Inspection, then, is difficult, sometimes impossible, and it becomes necessary to see to it that a large proportion of the product is set aside for testing under practical conditions and in sensitometric laboratories. In order to achieve this testing, large and well-trained staffs of employees are maintained, and it is the practice to recruit to these staff operators who have had a large measure of practical experience outside. Obviously, it is to our advantage to have a radiographer testing X-ray film, to have a former professional photographer testing sheet films and plates and to have an expert in laboratory work examining and

*Early Developing and Printing*

testing cinematograph film. It is an interesting observation that inspection and testing absorbs the time of approximately twenty-five per cent of all the employees of a large factory. I know of few industries where there is such a high proportion of testing to manufacture, but when one considers the demands which are made upon our products these days, the testing is imperative.

One of the biggest problems which is always present is that of the materials in which the sensitised goods are to be enclosed, when sending them out to the trade. This problem was great enough in the days when many types of wrapping and boxing materials were available. It is tremendously greater in these days, when one must accept as wrapping materials whatsoever can be procured. It is no longer possible to obtain paper made entirely from pure pulp, nor is it possible to get box board, straw board and the rest of the materials for the housing of the products free from contaminating chemicals or materials. It is obvious that the photographic manufacturer must do his best to protect his product, and it is a striking observation on the perseverance of some of the people involved in the finishing and wrapping end of the game that fairly long lives may still be given to photographic goods.

It must be remembered that these wrapping materials must lie intimately in contact with the highly-sensitive emulsions, that there must be nothing in them which will reduce or desensitise the silver emulsions, and that to a large extent we depend on the wrappings to protect the products against moisture. With the shortage of such available materials as aluminium foil, it has been necessary to do a great deal of contriving.

Volumes could be written on the problems of research, and development, and here, more than in any other field of endeavour, the photographic manufacturers merit your consideration. Some of the best-equipped research laboratories in the country are those belonging to the photographic manufacturers, and it may safely be said that a far larger percentage of the personnel engaged in the photographic trade are doing research and development work than in almost any other industry in the country. For the moment, of course, much of this research and investigation is directed towards Government needs, but there is still a considerable amount of pure abstract research going on, and history has shown that this research is worth while in the end.

It would be difficult, without discussing the question at much greater length than is possible to-day, to tell you the problems which have been solved in the last few years, with the aid of our scientists and technologists. The problems which have yet to be solved are many and varied. A great amount of work is being done along the lines of faster and finer grained emulsions, towards better photomechanical methods of printing and reproduction, towards better methods of using X-ray apparatus and equipment, and towards the problems of colour photography. When the history of this war is written, the contributions by the research workers of the photographic manufacturers will be well worth considering, because not only have these contributions played a considerable part in the war effort, but because they will open the way to new developments in the future. Let us hope that the time when this story may be told is near at hand.

*Sun Daughters*

HOW I WENT ABOUT IT

By Mrs. Rosalind Maingot, F.R.P.S.

An Informal Meeting of the Pictorial Group of The Royal Photographic Society, with Mr. F. J. Mortimer, C.B.E., Hon. F.R.P.S., in the Chair, was held on December 18th, 1942, when Mrs. Rosalind Maingot described how she came to take up photography, and gave some account of her sitters and models. The talk was illustrated by ninety-nine excellent slides.

IT is with great pleasure that I am here to talk about my work to this informal meeting of the Pictorial Group.

When I was fourteen years old (I am not going to give any dates), I exposed my first plate and made my first print. This was for fun. I only wish I could see that print now. An explorer friend of my mother's left a field camera in our attic, complete with darkroom equipment of the period. I had a school friend staying with me at the time and one day we decided that we would explore the

explorer's camera. I think it was half-plate. As I had already been taken by our friend many times in the attic, I felt I knew more about the operative side; so I decided to be the photographer and my friend the model. Fortunately, the plate was already loaded in the camera, with the cover drawn. The developer and fixing bath were made up in bottles, and I was told by our friend all about the very essential red light and never to let the fixing bath come in contact with the developer.

I then draped my friend's very

freckled face with one of my mother's large white chiffon scarves, very much in the manner of my draped heads to-day, stuck her up against an old sack, which the explorer had pinned on the wall near the window, to take me before he left, and pressed the magic bulb for the first time. I replaced the cover, took out the slide and we both went down to the cellar with our treasure.

We then proceeded to fix up a darkroom. We put some rugs, blankets and old sacks over a table, crept underneath and proceeded to develop the magic plate. We had no water, just two enamel dishes, two bottles and a red lamp, with a candle in it, I believe. Now, if someone had put his head under the blanket and rugs and said "What you are doing now will get under your skin one day and you will talk about it at the Photographic holy of holies in London, with many high priests present, including the big chief himself," not only would the intruder have spoilt my first shot, but I should probably have uttered a good old Australian expression, "Gow orn, nark it." No one did pop their head under the rug, and the collection of freckles on my friend's face appeared very sharply defined on the plate, which was slightly over exposed and very fully developed.

I then made up my mind that it should be fixed. Please note that I had no water. I did rock the hypo dish, and after it cleared we came out of our improvised darkroom with the wonder of wonders in my hand. We did wash it under the tap, back and front, and stood it up to dry near a window in the hot Sydney sun, and it did not melt. I think that the gelatin must have been tougher in those days. However, it did dry at last, and we put it in a printing frame with a piece of Seltona paper, or P.O.P., I cannot remember which. All I know is that again it was over-exposed, looked pretty purple to me, but we went back into our darkroom and fixed it in the same hypo. We did wash it!

After drying it, we mounted it in a grey oval slip-in mount and I presented it in triumph to my friend's mother, and what do you think she said? "Whoever made that photograph of Eileen in bed with measles?" I said, "I did it, and they're not measles, they're freckles."

I was very crestfallen with my first effort, and that brings me to twelve years ago, when I looked on the ground glass for the first time and pressed the magic bulb for the second time. In the intervening years I regarded people with cameras almost as lunatics as I travelled round the



Inside a Modern Factory

ways with us, but which have become increasingly burdensome as the war years have gone by.

From time to time it has been a pleasant task for me to show visitors around a large factory, concerned with the manufacture of goods used in the photographic trade. These visitors have been from all walks of life, from the most erudite savants to the equally interested, but less well qualified, rank and file enthusiasts. Without exception these visitors, who could, obviously, see only a fraction of the critical processes involved, have been astonished at the intricacies of the work, at the special

precautions and controls which have to be maintained, and at the meticulous selection which has to be made of the raw materials. Those of us engaged in the industry do not feel that we are vain when we claim that we have baffling and unique problems such as few industries have — problems calling for unusual standards of education on the part of executives and workers, and necessitating the establishment of first-class staffs of research and technical people.

Generally speaking, the structure of all large companies is somewhat similar, and no doubt every person in this



(Above) The Crinoline Dress ; (top right) Coquette ;
(bottom right) Brigadier Robert Luton, M.C., D.M.S.

a challenge. Now where could I learn photography? I racked my brains. I could not go to a studio as an apprentice and run a house at the same time. So a very kind friend came in and said, "There is a school of photography at the Polytechnic. Some of the students' work is in the window now." So I raced there next day, and interviewed Mr. Lyddon. I also very proudly took some of my victims' portraits. He looked at them with a poker face, turned away—I think he was wiping his glasses. I felt the verdict would never come. I tried to catch an expression on the back of his neck. He turned round and said, "You know, you have talent. You should learn photography," I said, "Please, won't you teach me privately? You see, I can't attend the classes, I haven't got the time." He proposed to give

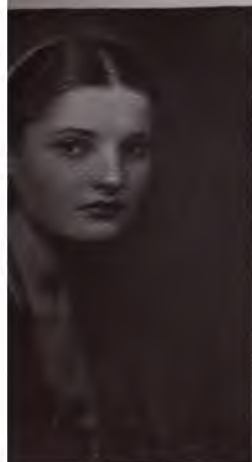
me my first lesson—half an hour in the lunch hour next day, with a model he would arrange from the art school. I could not sleep that night, my heart was bubbling over with excitement. I enjoyed the lesson. We only exposed two plates, and he told me to buy Lambert's "Studio Lighting."

The new term had begun, and I saw the students running in and out, just longing to be one of them. So I made a proposition to him that if I joined for this year's term, would I be unpopular if I only came when I could? He said, "Certainly." So I signed on the dotted line and was off.

I could tell you oceans of amusing incidents, but it would take too long. So I intend now to come up to date, as I have one hundred slides of my work and models to show you. We

are now back in 1942. My present equipment is a Kodak studio camera, the biggest one, of course. It runs up and down and has a bad habit of eating the black cloth or perforating the rubber tubing. I have three lenses, my first a Cooke anastigmat ten-inch f/3, my favourite; my second a Cooke twelve-and-a-half-inch f/3, a little near to No. 1; and a Zeiss Ikon sixteen-inch portrait 4.5, stopping down to f/32, which is grand for detail. I nearly always use a green filter as I use a lot of white satin. I use half-plate cut film, mostly super-XX pan or Ilford hypersensitive. I never use ortho film now. I have more or less standardised my work and find I am happiest with the materials I have learned to master.

I favour chlorobromide papers and use warm tone developer with glycine for these; also most of the slides you are about to see are developed with glycine. My favourite papers are Kodopal P. and G., Bromesko 49Z,



(Above) Silks and Satins ; (top left) Sir Hugh Devine ; (bottom left) Lucretia

...xe, which I develop with
hope to master Plastika

I find bromoils very
to do if I am not wanted
ne when I get them to the
ature. I started doing
les through my husband.
for his lectures. They are
ints. Mine are reduced
late. I develop my films
y time and temperature.
thing from start to finish
luding making some of the
have had to find out quite
ngs myself, as I never hear
hop" spoken at my own
xed that though by going
pera Club for lunch every
r, which reminds me that
Wednesdays ago I arrived
seat at the centre dining
to the well-known 35 mm.
er, Mr. Lancelot Vining.
oling out prescriptions for
event one from catching a

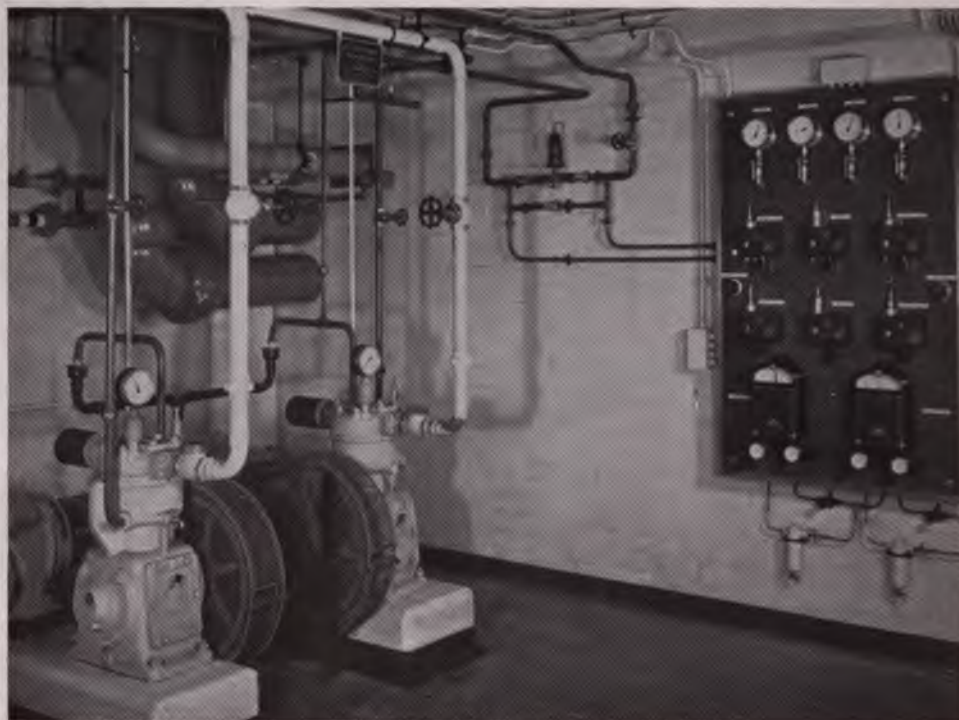
cold. I just gave him one look and
he said, "I suppose you know
something about this." I looked
pathetic, and under my breath I
thought "You're telling me!" There
was silence, and everyone attacked
their sausage and bacon, until the
camera "shop" started off again, and
I listened in.

I use two spotlights and a floor
lamp for my background. I have a
Kodak model lamp, a square one that
had four pieces of blue glass which
I have thrown away. I cover it with
two layers of blued-white butter
muslin. I have four units of junior
general lighting, two or three odd
lamps with nitrophote bulbs. Some
of these are the original ones. The
background to me is most important.
I have white, red and black satin
curtains, red brocade curtains and a
wall tapestry; I think I have had
every type of curtain. I will explain
this as I go with the slides. These
curtains are in three lengths of three-

and-a-half yards, tacked together by
hand and not sewn by machine as it
rucks up. Also the hooks are put on
straight and the top must not be
frilled.

I will first of all show you some
slides of friends who have kindly sat
for me, and on these I will talk before
you see the models. This will take
you over high and low key work.
You will be glad to know that you are
going to see some new stuff which no
one has seen but myself; also some
old ones which will make you laugh,
I hope.

Now, as we are nearly up to the
slides I want to mention one thing in
which I am most interested, and that
is the expression on the faces of the
sitters. Many of us here have been
through the stage when our heads were
clamped in some apparatus which
resembled a dentist's chair. I do
believe that that saying, "I'd rather
go to a dentist than a photographer,"
was inherited from those days.



Control Equipment

THE PRESIDENTIAL ADDRESS

The President, Mr. D. McMaster, F.R.P.S., delivered his Presidential Address on December 12th, 1942, at the Society's House, 16, Prince's Gate, S.W.7, on "The Rôle of the Photographic Manufacturer." Mr. F. J. Mortimer, C.B.E., Hon. F.R.P.S., Past President, occupied the chair.

The CHAIRMAN said that less than a year ago he gave a Presidential Address, Mr. McMaster being in the chair; this year the positions were reversed. At the end of his own address he said that all the official bodies and Ministries with which he had been in touch in securing data had frankly admitted the great debt they owed, not only to Photography, but to photographic manufacturers, for the continuous progress which had taken place in apparatus, equipment, methods and material. The tremendous demands made upon this specialised industry were not generally realised, and the contribution made to the war effort reflected great credit on those concerned. Mr. McMaster was taking up the story where he himself had left off.

There was no one more able or competent to give such an address with the voice of authority than Mr. McMaster; no one knew more about photographic manufacturers or photographic manufacturing.

THE RÔLE OF THE PHOTOGRAPHIC MANUFACTURER

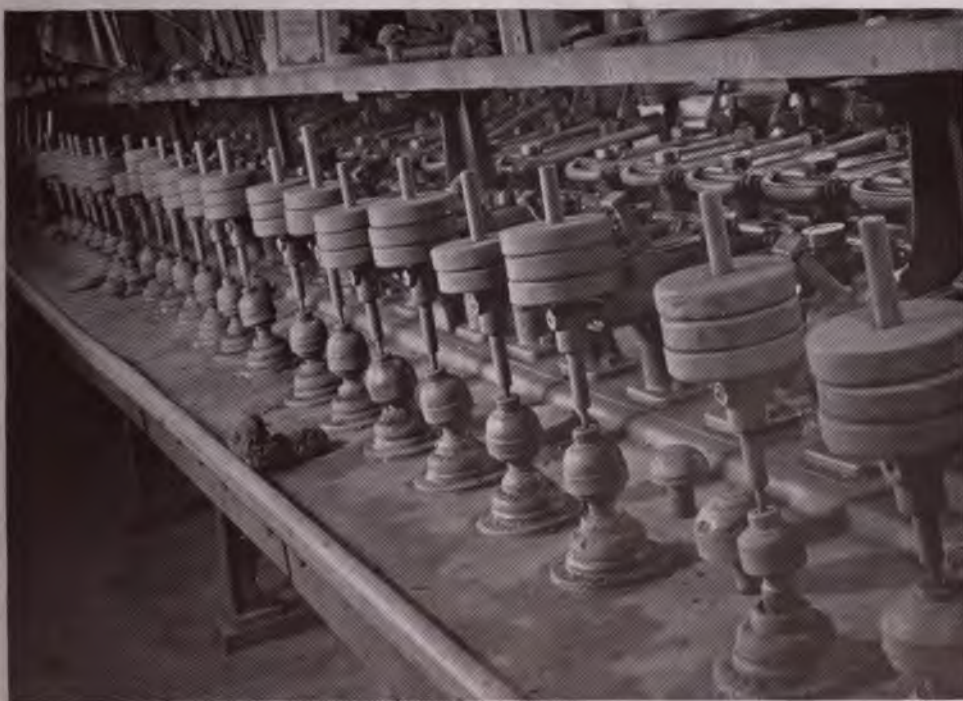
By D. McMaster, F.R.P.S.

I COME to you to-day as a representative of a down-trodden and subdued minority in the photographic world, as a spokesman for a group ever willing to spend huge sums of money to advertise its products, but seldom articulate on its peculiar and, at times, almost overwhelming problems. I am a manufacturer of materials for the photographic and allied trades. The enthusiastic amateurs have clubs, societies and associations of all sorts to present their stories. For the large

body of unattached users of our products the Board of Trade and similar institutions act as sponsors. The professional photographers are excellently represented by the Institute of British Photographers. The technicians of the cinematographic trade and of roentgenology are similarly served. But no one—except themselves—holds a brief for the much abused manufacturers. It is my hope that for a short time I can interest you in some of the worrying and interesting problems which are



Shutter Repairs



Lens Grinding

Arthur S. Quittenton, London (B).
James Small, Belfast (F).
Harold White, Kent (B).

In July :

Carl W. Blakeslee, Florida (A).
Yousuf Karsh, Ottawa (A).
Ralph A. Metzger, Pennsylvania (A).

In November :

G. C. Brock, Farnborough, G.
A. Cornwell-Clyne, London (G).
Gabor Denes, London (B).
Hon. M. W. Elphinstone, London (A).
E. D. Eyles, London (G).
D. R. Fisher, Capetown (G).
H. Gershman, London (B).
Shirley M. Hall, Pasadena, California (A).
R. J. Hercock, London (G).
G. A. Jones, London (G).
H. Mandwall, London (B).
Hywel Murrell, Beaulieu (F).
S. W. Newbery, London (B).
G. K. Newby, Halifax (A).
B. J. Ochsner, Durango, Colorado (A).
W. S. Pitt, London (D).
Josephine A. Smith (Miss), Windsor, Ontario (A).
W. Lancelot Vining, London (B).
E. J. Wender, Bombay (E).

The following Member was reinstated in the Fellowship upon re-joining the Society :

G. F. Prior.

The Associateship

The following Members were admitted to the Associateship (the same signification attaches to the letters in brackets after their names in respect of the sections in which they qualified as in the case of the Fellowship) :

In January :

Allen Aldington, London (A).
Axel Bahnsen, Ohio, U.S.A. (A).
J. A. Brimble, London (A).
C. S. Gerrish, London (A).
A. B. Gnaegi, Leicester (A).
J. G. Jettreys, London (A).
Clifford Lake, London (A).
Norman Lythe, Leeds (A).
A. C. Mayer, Aberlour (A).
David Owen, Bangor (A).
A. F. Peacock, Leicester (A).
A. H. Pinfild, Birmingham (A).
C. O. Thomas, London (A).
A. W. Walburn, Exeter (A).
H. T. Winterhalder, Kettering (A).
F. G. Wrigley, Rotherham (A).

In April :

Nicholas Charles Bernard Hesse Allen, Morecambe (A).
John Samuel Barlee, Dartmouth (D).
Arthur Lawrence Edward Barron, London (F).
Percy Bentley, Vancouver (A).

William Herbert Billings, Detroit (A).

Theodosia Mary Dawes Bond, Toronto (A).

John Antony Salkeld Brown, Bury (E).

Iovet Halket Cave-Chinn, Maidenhead (E).

Ira Iowa Chamberlin, Massachusetts (A).

Fred William Chambers, London (F, G, H).

Digamber Chatterjee, London (A).

D. Garside Daggett, London (A, B).

Walter Daniel Emanuel, London (H).

Frank Fenner, Jr., Chicago (A).

John Ferguson, London (A).

Nancie Foster, London (A).

William Crichton Fothergill, Darlington (C).

Frank Gibson, Edinburgh (A).

Frederick Goldring, Haslemere (A, B).

Kenneth Whitaker Green, Wirral (B).

Vernon Clarence Guest, Sydney (A).

Wallace Harvey, Coventry (F).

Roderick Arnold Holliday, Pietermaritzburg (A, D).

Louis Kershaw, Heaton (A).

John G. Marshall, Brooklyn (G).

Don Dale Nibbelink, Binghampton (C).

Muriel Mary Swain Holler, Norwich (A).

Douglas Arthur Parr, Camberley (B).

Walter Sydney Pitt, Walton-on-Thames (D).

Oswald Pierce Roberts (Capt.), Formby (C).

Charles Trotwood Salt, Mickleover (B).

Ira A. Schur, New York (A).

Henry Ernest Scrivener, London (G).

Charles F. Snow, Colorado (A, B).

Ernest H. S. van Someren, London (F).

Norman Alfred Squire, London (A).

Frank Spencer, Mytchett (F, G).

Geoffrey Brian Stanford, London (G).

George Norman Stanilorth, London (A).

Alan Thompson, Preston (F).

Wiltred Ernest Tomlinson, Falmouth (A).

David Storr Unwin, London (A).

William Urton, Chesterfield (F).

Eugene John Wender, Bombay (E).

Sidney Whiteley, London (G, H).

Victor Percival Williams, London (A).

In July :

William E. Ball, London (A).

A. D. Bensusan, Jr., S. Africa (A).

Alfred Bolton, Bradford (A).

Thomas H. Breakell, Cheshire (A).

Percy Broome, Cheshire (A).

John P. Carney, New South (A).

J. H. Champion, South Africa (A).

Nat Cowan, South Africa (A).

Chas. E. Crompton, California (A).

Grant Duggins, California (A).

Joseph J. Munroe, Detroit (A).

Karl F. Rosenberg, Padi (A).

Arthur L. Spence, Ketter (A).

James H. Thomas, New (A).

Joseph H. Williams, Liver (A).

Ralph W. Williams, Johns (A).

In November :

G. Allan (Rev.), Port Glas (A).

H. Atkinson, Huddersfield (A).

C. B. Atwater, Newtonvi (A).

Wilfrid Barber, London (A).

W. F. Berg, Harrow (F).

P. Brewster, Coventry (A).

W. P. Burningham, Lond (A).

Alex. Cain, Aberdeen (A).

John Cardiff, Slough (E).

Ian B. Carter, St. Albans (A).

Bernard Smith Chadwick, mouth (E).

Leslie Chapman, Leeds (A).

C. S. Chaplin, Gloucester (A).

Alvin E. Coleman, New Y (A).

R. B. Collins, London (F).

J. B. Dalrymple, Glasgow (A).

K. K. Drury, Leicester (F).

R. W. Fairbridge, Perth, Australia (A).

J. L. French, London (A).

G. E. Gaisford, Sheffield (A).

Edgar Gaze, Gloucester (F).

G. Gemmill, Burnley (A).

G. D. Greene, St. Louis, U. (A).

W. J. Greenwood, Peter (A).

D. H. J. Hardy, London (A).

M. Hatry (Mrs.), New Yor (A).

T. W. Howard, Gerrards C (A).

Olga E. Irish (Mrs.), New Y (A).

M. W. Keene, High Wyco (A).

L. Kutner, London (B).

John Lomax, Manchester (A).

Frank Ludford, Birmingham (A).

G. H. Ludins, Hartford, C (A).

R. H. Mason, London (B).

W. J. H. Milner, Petersfel (A).

Bee Minter (Mrs.), Cambri (A).

D. E. Newham (Mrs.), S (A, B).

John Nicol, London (A).

J. A. Parsons, Boreham W (A).

L. G. Rachiele, Montreal (A).

S. Alton Ralph, Springfield U.S.A. (A).

N. Rosenweig, Brooklyn, (A).

G. E. Ryerson (Rev.), Lon (A).

Ralph Sanders, Birmingha (A).

Robert E. Scott, Strabane (A).

E. W. H. Selwyn, Harrow (A).

H. L. Silcocks, Florida, U.S (A).

C. A. Steed, Harrow (F).

S. M. Swenson, New Jersey (A).

Ronald Thompson, Denbigh (A).

N. W. Tucker, London (F).

Robert M. White, Glasgow (A).
C. Iredale Williams, Amesbury (F).
V. Willmott, London (F).

The following Members were re-elected in the Associateship upon joining the Society:
John Hinde, W. Lord, Maxwell Wilson.

Honorary Foreign Corresponding Members of the Council

The following were appointed Honorary Foreign Corresponding Members of the Council for the year under review: In America—Dr. C. E. K. (Honorary Fellow) and Mr. MacDonald (Honorary Fellow); France—Mr. L. P. Clerc (Honorary Fellow); in Australia—Mr. Harold Meaux (Honorary Fellow); in South Africa—Mr. Will Till (Fellow). Mr. Pirie MacDonald died in April, Mr. Joseph M. Bing (Fellow), of New York, was appointed to succeed.

Hurter & Driffield Memorial Lecture

The thirteenth Hurter and Driffield Memorial Lecture was delivered on November 28th, at 16, Prince's Gate, S.W.7, by Dr. S. O. Rawling (Fellow). The subject selected by Dr. Rawling for the lecture was "Sensitometry of Hurter and Driffield."

The Permanent Collection

During the year two House Exhibitions were provided from the Society's collection, thus enabling members and visitors to make acquaintance with a portion, although a comparatively small portion, of our collections. It has also been drawn on to provide a large proportion of illustrations for the book, "Vicarian Photography," by Alexander Messer, F.R.P.S., published by the Royal Press, London.

Further additions have been made during the year, and the Collection still further outgrown its housing space. Unfortunately the cabinets required still remain unobtainable under present circumstances.

No further acquisitions have been made under the terms of the Tyng Foundations, for reasons previously stated.

The thanks of the Society are due to Mr. J. Dudley Johnston (Honorary Fellow) for his services as curator.

The Library

The systematic purchase of new books, which would not otherwise be added to the Library, has added considerably to its completeness, and a careful watch has been kept for books of historical interest not

already in the Library. Lists of additions are published at intervals in the *Journal*, and this has resulted in a good deal more use being made of the Library.

A complete list has been made of periodicals which are not now obtainable, with a view to securing them when the time is opportune.

The re-arrangement of the books on the shelves, from the old system of a fixed location to that of a systematic classification, is in progress.

The kindly thought of all those who have enriched the Library by gifts of books is warmly appreciated.

The thanks of the Society are due to Mr. A. E. Cummins for his services as Honorary Librarian.

Presidential Addresses

The year was distinguished by two Presidential Addresses, the first being given by the retiring President, Mr. F. J. Mortimer, C.B.E., F.R.S.A., Hon. F.R.P.S., on February 10th, and the second by his successor, Mr. D. McMaster, F.R.P.S., on December 12th.

Mr. Mortimer again took as his subject "Photography's Part in the War," summarising its notable achievements down to the date of the address, and putting on record its remarkable contribution to the war effort. The address was published in the April issue of the *Journal*, "Photography in Science, Art and Industry."

Mr. McMaster took as the subject of his Address "The Role of the Photographic Manufacturer," in which he brought into relief the extraordinary complexities of manufacture—which made research a prime essential—the organisation and administration of production in the factories, and the distribution of the finished goods. It is a subject which had not previously been dealt with in a Presidential Address, and will make a most valuable contribution to photographic literature when it is published in the *Journal*.

The Photographic Alliance

The Eleventh Annual General Meeting of the Officers of the Allied Associations was held at 16, Prince's Gate, S.W.7, on April 18th.

At this meeting, Mr. John White was appointed President, in succession to Mr. W. E. Gundill, O.B.E., J.P., F.R.P.S., Mr. W. J. Foster, A.R.P.S., Vice-President, and Mr. J. S. Lancaster, F.C.I.S., Honorary Secretary.

Messrs. W. J. Foster, A.R.P.S. (Western Counties Photographic Federation), Fred Green, A.R.P.S. (Midland Counties Photographic Federation), and G. E. W. Herbert (Central

Association of Photographic Societies), were appointed the Alliance representatives on the Council of The Royal Photographic Society.

The activities of the Alliance were directed throughout the year by an Emergency Committee consisting of the President, Mr. John White; the Vice-President, Mr. W. J. Foster, A.R.P.S.; the Honorary Secretary, Mr. J. S. Lancaster, F.C.I.S.; and the Permanent Secretary, Mr. H. H. Blacklock, F.C.I.S., F.R.P.S.

The Alliance Print and Slide Competitions were resumed after an interval of two years, and the Council desires to place on record their appreciation of the services of the Northern Counties Photographic Federation in organising the competitions.

Publication of the Photographic Red Book has been suspended since 1940, but the Alliance Year Book was produced and issued to the Secretaries and Officers of the Affiliated Societies, serving to keep them in touch with the changes and development that had taken place since the publication of the previous year's issue.

The Alliance lectures and portfolios have been in constant demand throughout the year.

The Council have much pleasure in placing upon record their appreciation of the valuable services rendered to the Alliance by Mr. J. S. Lancaster, F.C.I., as Honorary Secretary and Treasurer, and also as Editor of the Alliance Year Book.

The Society's Meetings

The ordinary meetings of the Society, many of them arranged by the Groups, have been held on Saturday afternoons, while the Colour Group and Kinematograph Section arranged a few evening meetings during the summer months, and the Pictorial Group, as an experiment, arranged several Friday evening meetings during the 1942-43 Lecture Session. The Joint Meetings with leading provincial societies were also continued, and the Council appreciate the general desire that these should become a permanent feature. They have been most helpful in establishing a closer contact between the R.P.S. and the Affiliated Societies.

The thanks of the Society are due to the lecturers in London and the Provinces, and to the Honorary Secretaries of the Societies, who arranged the Joint Meetings—Mr. W. H. Leigh (Bath Photographic Society), Mr. Eric H. Bellamy (Birmingham Photographic Society), Mr. H. M. Storey (Bradford Photographic Society), Mr. H. Foscutt, A.R.P.S. and subsequently Mr. R. A. Fathers (Leicester and Leicestershire Photo-

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st DECEMBER, 1943

1941.		1941.		1941.		1941.	
£	s. d.	£	s. d.	£	s. d.	£	s. d.
TO ESTABLISHMENT EXPENSES:—							
192	7 2	...	...	221	7 6	...	...
246	2 4	Salaries, Wages and Honorarium	...	431	3 6	Subscriptions	...
77	9 2	Printing and Postages	...	109	1 2	Less Relate to Federations for	...
...	...	National Insurance, Telephone and Incen-	...	...	...	R.P.S. Members	72 17 6
...	...	tails	...	...	...	Less Relate to Societies for	...
45	11 0	Ballot and Report	...	...	...	R.P.S. Members	53 11 0
60	14 0	Publicity	...	63	3 3	...	...
21	0 0	Honorarium to Auditors	...	63	14 0	...	...
223	19 1	Fuel, Light and Water	...	21	0 0	...	...
155	1 6	Repairs and Upkeep to House, Fire Insur-	...	235	3 6	...	...
...	...	ance and Garden Rate	...	140	8 3	...	...
246	0 0	War Risks Insurance for Building and	...	...	...	...	...
...	...	Contents	...	98	0 0	...	...
3	5	Permanent Collection and Museum	...	10	...	...	...
£2921	5 3			3385	2 5		
TO DEPARTMENTAL EXPENSES, as per annexed Accounts:—							
1238	10 9	Journal	...	1202	16 7	...	...
86	16 10	Library	...	78	8 6	...	...
27	2 2	Exhibition	...	34	7 1	...	...
£1454	11 9			1315	12 3		
TO EXCESS OF INCOME OVER EXPENDITURE:—							
1013	5 4	Carried to Capital Account	...	1608	13 10	...	...
£3899	5 4			£3894	7 5		

JOURNAL ACCOUNT				Cr.	
Dr. 1941.		1941.			
£ s. d.		£ s. d.		£ s. d.	£ s. d.
To EXPENSES :-					
1989 2 5	Printing...	...	...	1187 13 5	Advertisements (<i>less</i> Commission) ...
522 17 8	Blocks	...	...	563 5 2	Sales ...
544 18 4	Postages and Stationery	...	...	31 14 9	Sale of Blocks ...
64 5 8	Reporting, Reprints and Sundries	...	...	1782 13 4	
				1388 10 9	BY BALANCE carried to Revenue Account ...
				<u>£3071 4 1</u>	<u>£2924 15 3</u>
					1721 18 8
					1202 16 7
					<u>£2924 15 3</u>

LIBRARY ACCOUNT					
Dr.		1941.			
£ s. d.		£ s. d.		£ s. d.	£ s. d.
To EXPENSES :-					
23 2 0	Honarium to Librarian and Assistant	...	...	...	...
55 16 10	Binding and Sundries, including Provision of	...	...	...	...
	f50 ...	...	...	...	...
	Purchase of Books (Unexpended Balance	...	...	...	...
10 0 0	f31 15s. 6d. in hand)	...	...	...	...
				88 18 10	BY BALANCE carried to Revenue Account ...
<u>£88 18 10</u>				<u>£88 18 10</u>	<u>£135 16 9</u>
					57 8 3
					78 8 6
					<u>£135 16 9</u>

EXHIBITION AND LECTURES ACCOUNT					
Dr.		1941.			
£ s. d.		£ s. d.		£ s. d.	£ s. d.
To EXPENSES :-					
92 2 7	Catalogue Printing and Blocks	...	...	197 8 7	Advertisements in Catalogue (<i>less</i> Commis-
63 15 5	Postage, Stationery, Printing and Incidentals	...	...	...	sion) and Sale of Catalogues ...
68 12 9	House Exhibitions, Committee and Lectur-	...	...	222 0 7	
	ers' Expenses, and Sundries	...	...	27 2 2	BY BALANCE carried to Revenue Account ...
				<u>£256 7 8</u>	<u>£256 7 8</u>
<u>£254 10 9</u>					
					222 0 7
					34 7 1
					<u>£256 7 8</u>

CAPITAL ACCOUNT FOR THE YEAR ENDED 31st DECEMBER, 1942

1941.		1941.		1941.	
f	s. d.	f	s. d.	f	s. d.
22	0 6	To Expenditure in connection with Maintenance of New Premises	...	...	...
22496	15 10	To Balance, being Amount of Capital Fund carried to Balance Sheet	...	...	...
22496	15 10		2142	9 6	By Balance at 31st December, 1941
			209	3 7	By Contributions during 1942
			154	7 0	By Entry Fees, 1942
			1013	5 4	By Surplus from Income and Expenditure Account
					1503 12 10
					24474 2 0
					24474 2 0

TRUST FUNDS

In the name of The Royal Photographic Society :—

PHOTOGRAPHIC ALLIANCE.
£1,855 13s. 9d. 2½% Consolidated Stock.
CENTRAL ASSOCIATION OF PHOTOGRAPHIC SOCIETIES.
£376 2½% Consolidated Stock.
HENDERSON AWARD.
£168 2s. 6d. 2½% War Loan.

SCIENTIFIC AND TECHNICAL GROUP.
300 National War Savings Certificates.

In the names of Messrs. F. F. Renwick, H. Abbott and G. C. Weston.
 BRITISH H. TYNO FOUNDATION.
 £1,015 4s. 7d. Commonwealth of Australia 5% Loan, 1945-75.

In the names of Messrs. S. H. Written, R. H. Lawton and F. F. Renwick:—

HURTER AND DRUFFIELD FUND.
 £400. 5½% N.S. Wales Inscribed, 1947-57.
 £80. 3½% Bradford Corporation Redeemable Stock, 1940-70.
 £264 2s. 1d. 3½% War Stock.

In the names of Messrs. J. C. S. Munnery and R. H. Lawton :—

TRAIL TAYLOR MEMORIAL FUND.	
£100.	3½ % New Zealand Government Stock, 1949-54.
£100.	Ditto 1955-60.

1941.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
TO LIABILITIES :-				
945 10 7	Sundry Credits	...	...	...
22 17 6	Locker Deposits	...	...	...
227 15 5	Subscriptions in Advance	...	...	...
24 9 0	Suspense Account	...	...	...
1240 12 6				
				3096 12 10
TO SPECIAL FUNDS :-				
WILLIAMSON PHOTOGRAPHIC RESEARCH AWARD :-				
380 12 6	Capital	...	...	...
83 5 6	Interest (Less Awards)	...	...	...
463 18 0				
				254 11 6
				228 17 0
HENDERSON AWARD :-				
151 15 8	Capital	...	...	...
41 1 6	Interest	...	...	...
192 17 2				
				151 15 8
3081 10 0	To LIFE MEMBERSHIP ACCOUNT	...	...	...
22496 15 10	To CAPITAL ACCOUNT, being Amount of Accumulated Fund	...	...	...
				532 8 2
BY INVESTMENTS :-				
2532 14 9	£2,500 3½% War Loan, cost	...	...	...
929 12 5	£1,000 Central Electricity Board 6% Stock, 1955-75, cost	...	...	...
---	£1,000 3% Defence Bonds, cost	...	...	...
---	£1,000 3% Saving Bonds, cost	...	...	...
---	200 National Saving Certificates, cost	...	...	...
3462 7 2				
				5512 7 2
BY PROPERTY ACCOUNT :-				
1000 0 0	Equipment at original Valuation, £6,200 (less Reserve, £5,200)	...	...	...
19000 0 0	16, Prince's Gate, S.W.7, at Cost	...	...	...
20000 0 0	NOTE : Property and Equipment insured against Fire for £34,620, and War Damage.	...	...	...
£27475 13 6				
				£29724 16 8

(Signed) D. McMASTER, President.
(Signed) R. H. LAWTON, Hon. Treasurer.

AUDITORS' REPORT.
We report that we have audited and vouched the Books of The Royal Photographic Society of Great Britain for the twelve months ending 31st December, 1942, and we have obtained all the information and explanations that we have required.
In our opinion the above Balance Sheet and accompanying Accounts exhibit a true and correct view of the working of the Society for the twelve months, and of its financial position (subject to the value placed upon the equipment at 31st December, 1942), according to the best of our information and the explanations given to us and as shown by the Books of the Society.

11-13, Downgate Hill, London, E.C.4.
8th February, 1943.
(Signed) CALDER-MARSHALL, IMOTSON & BOUND,
Chartered Accountants, Hon. Auditors.

Mr. J. H. Ahern, F.R.P.S., and Mrs. G. M. Ahern, A.R.P.S., for their exhibit, Cat. Nos. 302, 303, 304, and 305, Cape Egon and Chalk Point, Victoria, featuring Chick, Cape Egon, and Chalk Point. Mr. J. H. Ahern, F.R.P.S., and Mrs. G. M. Ahern, A.R.P.S., for their exhibit, Cat. Nos. 302, 303, 304, and 305, Cape Egon and Chalk Point, Victoria, featuring Chick, Cape Egon, and Chalk Point. Mr. J. H. Ahern, F.R.P.S., and Mrs. G. M. Ahern, A.R.P.S., for their exhibit, Cat. Nos. 302, 303, 304, and 305, Cape Egon and Chalk Point, Victoria, featuring Chick, Cape Egon, and Chalk Point.

The Council have pleasure in recording their appreciation of the efforts of the members of the Society in the preparation of the Annual Exhibition. The Council have pleasure in recording their appreciation of the efforts of the members of the Society in the preparation of the Annual Exhibition. The Council have pleasure in recording their appreciation of the efforts of the members of the Society in the preparation of the Annual Exhibition.

The Annual Exhibition

The 87th Annual Exhibition was held at the Society's House, 16, Prince's Gate, S.W. 7, from September 5th to October 21st, 1942.

It was opened by the President, Mr. D. McManis, F.R.P.S., at the Private View on September 16th.

A feature of the Exhibition which attracted considerable interest from visitors was the display of modern aircraft camera and military equipment, with a collection of reconnaissance air photographs of Germany, showing the effect of our bombing and other interesting details.

The Society is indebted to the Air Ministry and the Ministry of Aircraft Production for the important exhibit.

The Society's Medal was awarded to Mr. S. Boulton, F.R.P.S., for his exhibit, Cat. Nos. 319 to 352, Life Histories of the White Admiral Butterfly, Emperor Moth, Large White Butterfly, and Euro Host Moth, to Mr. Alfred Saunders, F.R.P.S., for his exhibit, Cat. Nos. 302, 303, 304, and 305, Cape Egon and Chalk Point, Victoria, featuring Chick, Cape Egon, and Chalk Point, and to Mr. G. W. Foster (Member) for his exhibit, Cat. Nos. 353 to 358, New Zealand King Long Horns, including a set of 14 Indian Birds and a set of 14 Indian Birds.

The Hood Medal, presented annually by Mr. Isaac of France, F.R.P.S., in recognition of members' personal

contributions to the Society's work during the year, was presented to Mr. J. H. Ahern, F.R.P.S., for his exhibit, Cat. Nos. 302, 303, 304, and 305, Cape Egon and Chalk Point, Victoria, featuring Chick, Cape Egon, and Chalk Point. Mr. J. H. Ahern, F.R.P.S., and Mrs. G. M. Ahern, A.R.P.S., for their exhibit, Cat. Nos. 302, 303, 304, and 305, Cape Egon and Chalk Point, Victoria, featuring Chick, Cape Egon, and Chalk Point. Mr. J. H. Ahern, F.R.P.S., and Mrs. G. M. Ahern, A.R.P.S., for their exhibit, Cat. Nos. 302, 303, 304, and 305, Cape Egon and Chalk Point, Victoria, featuring Chick, Cape Egon, and Chalk Point.

The Council have pleasure in recording their appreciation of the efforts of the members of the Society in the preparation of the Annual Exhibition.

"The Photographic Journal"

The *Journal* has been published throughout the year, and has constituted a record of the Society's activities.

The April number was again issued as a special number under the title "Photography in Science, Art and Industry," and The Year's Photography, the Exhibition special publication, containing a selection of pictures from the pictorial, natural history and record sections, with critical appreciations of these sections, in October. It was very quickly out of print.

The Paper Control restrictions took effect during the year, and were the principal source of concern in the production of the *Journal*. The substitution of a paper of thinner weight than that normally used enabled a larger number of pages to be available for each issue than would otherwise have been possible, and the use of smaller type helped further to minimize the effect of the restrictions.

Even more helpful in this respect was the co-operation of the industry in the restriction of the pages allotted to advertisements, and the consequent unavoidable cutting down of space to individual advertisers. All agreed to this course, and the Council desire to place on record their appreciation of this spirit of co-operation, and of the valuable advertising support which they extended to the *Journal* during the year.

The renewed activities of the Group during the year was reflected in the greater variety of the contents of the *Journal*, and contributed to the restoration of the balance between the various photographic interests represented in the Society's Membership.

The Council of the Society are indebted to the Advisory Committee and the members of the Society.

"Photographic Abstracts"

"Photographic Abstracts" have continued to be published throughout the year, although the issues have not been regular. This has been due to the fact that the material is entirely new to each issue. Most of the material has been collected by the members of the Society, and the material is of a high standard of interest, and is of the highest quality.

The number of abstracts published is approximately the same as in previous issues, and abstracts from Continental publications have been included, although war conditions prevent most of these publications from being available to the general public.

The Editor, Mr. L. V. Chilton, has received the assistance of Mr. V. Gallafent, who has taken over the Patent Specifications Section.

In war time "Photographic Abstracts" is even more indispensable to the serious photographic student and technician than in peace time, since it is the only convenient medium through which they are advised of developments both at home and abroad, in the latter case, as mentioned above, from sources which are not generally available.

The Council have pleasure in recording their appreciation of the work of the Committee of the Scientific and Technical Group and the Editor, Mr. L. V. Chilton, M.A., F.Inst.P., F.R.P.S., and the Assistant Editor, Mr. V. Gallafent, M.Sc., A.R.C.S., D.I.C., F.C.I.P.A., in the production of this invaluable journal.

Exhibitions

The following exhibitions were held at the Society's House during the year:—

January—(1) Prints by J. H. Ahern, F.R.P.S., and Mrs. G. M. Ahern, A.R.P.S.; (2) Prints by Ronald Rigby, F.R.P.S.

February—(1) Prints by the late J. McKissack, F.R.P.S.; (2) Prints by the late Mrs. G. A. Barton.

March—(1) Annual Exhibition of the Members of the Miniature Camera Group; (2) Prints by Hugo van Wadenoyen, F.R.P.S.

April—(1) Prints by Overseas Readers of *The Amateur Photographer*; (2) Prints by Women Photographers, including Miss Hilda Bailey, A.R.P.S., Miss Pamela Booth, F.R.P.S., Miss Patricia Booth, Mrs. Lawrie Black, Mrs. Helen Campbell, F.R.P.S., Miss Winifred Cooper, Mrs. K. L. Fulllove, A.R.P.S., Miss Blanche Henry,

Miss Anne Jackson,
Miss Hilda Jordan,
Mrs. Olive Leigh, F.R.P.S.,
Salind Maingot, F.R.P.S.,
Ia M. Newby, F.R.P.S., Mrs.
Parsons, F.R.P.S., Mrs.
Ralli, F.R.P.S., Miss Daisy
F.R.P.S., Mrs. Clifton Tabor,
and Mrs. G. Underell.

(1) Central Association of
Photographic Societies; (2) Prints
Members of the Southampton
Club.

(1) Pictorial Group Annual
Exhibition; (2) Recent Additions to
Permanent Collection.

(1) Prize Competition Prints
Members of *The Amateur Photo-*
grapher Group.
(2) Prints by Members of
the Society's Annual
Exhibition.

Oct.—The Society's Annual
Exhibition.

Nov.—"Photography in Sci-
ence and Industry," organised by the
Association of Scientific Workers.
Dec.—Landscape and Por-
trait Photography, Past and Present,
the Society's Permanent Col-

lection. "Photography in
Science and Industry," was opened
by the President of the Association
of Scientific Workers, Sir Robert
Watt, C.B., F.R.S., and
much interest. The Council
propose to co-operate with the
Association in making its exhibition
available for the Exhibition,
and that it will be the fore-
most of other exhibitions of a
kind. The meetings which
were arranged in connection with the

Exhibition were also much appre-
ciated.

Williamson Research Award

This Award was founded by the late
Mr. R. Williamson (Fellow) and his
brother, Mr. R. H. Williamson, for the
purpose of encouraging photographic
research among younger workers in
photography, whether professionally
interested or not. It is administered
by the Scientific and Technical
Group. The Award may be in cash,
or by way of the purchase and loan of
apparatus.

On the recommendation of the
Committee of the Scientific and
Technical Group, with the approval
of the Department of Scientific and
Industrial Research, the following
Awards were made in 1942, for the
period from the previous Award to
the end of 1941:—

£30 to be divided equally
between the three authors of their
paper, "Latent Image Distribu-
tion," F. W. Berg (Associate), A.
Marriage (Fellow) and G. W. W.
Stevens (Fellow) (*The Photographic
Journal*, September, 1941, pp.
413-424), and the loan of the
following apparatus to Mr. J. H.
Coote (Fellow) for the purpose of
building a densitometer to assist
him in making practical investi-
gations of some of the variable
factors in the production of
tricolour separation negatives for
subtractive colour printing: An
annular silver wedge, 3½ ins.
diameter, £1 19s. 6d.; a 17 × 36
mm. photocell, £1 15s.; and
Unipivot Galvanometer, £8 0s. 1d.

The income of the Fund is derived
from an investment in £600 (nominal)
Local Loans, 3 per cent.

Finance and the Society's Premises

The result of the year's working
shows an excess of income over ex-
penditure of £1,503 12s. 10d.

During the year £1,000 was in-
vested in 3 per cent War Bonds, and
£1,000 in 3 per cent Savings Bonds.
In addition, £500 was deposited in the
Post Office Savings Bank, and £150
was invested in 200 War Savings
Certificates. This total investment of
£2,650 in one year helps to accelerate
the usually slow process of building
up substantial reserve funds. The
Council fully realise the desirability
and indeed the necessity of such re-
serve funds, especially in connection
with its premises. Prudence dictates
the provision of financial safeguards
against all contingencies. It again
gives the Council much pleasure, in
this connection, to place on record
their appreciation of the donations by
Members to the New Premises' Special
Fund, which amounted during the
year to £213 11s. 10d. This brings
the total contributions of Members
and friends to this Fund to the sum of
£11,209 12s. 3d., or approximately 50
per cent of the cost of the premises
and their adaptation to the Society's
purposes.

Signed on behalf of the Council,

D. McMASTER,

President.

8th February, 1943.

ANNUAL GENERAL MEETING

Annual General Meeting of
Fellows, Associates and Mem-
bers was held at 16, Prince's
Street, W.7, on Tuesday, March
3. The PRESIDENT, Mr. D.
R. W. Watt, was in the chair.

SECRETARY read the notice
of the Meeting.

On motion of the PRESIDENT,
by Mr. F. J. MORTIMER, it
was resolved to receive the Report and
Statement of Accounts.

PRESIDENT said that there
were two points in the Report
which he would refer very briefly.
The gain in membership—400
in 1942, not only of the
Fellows and Associates but of the
enthusiasm for photo-
graphy in the world at large, but of
the growth and virility of the
Society. In that increase of member-
ship was high cause for con-
gratulation. Not a little of this

favourable result was due to the
work of Mr. Blacklock, the Secretary,
and Mr. Dudley Johnston, the
Honorary Secretary. Only those
who had worked closely with those
two gentlemen had an opportunity
of assessing their real value to the
Society.

During the past year the lectures
had been good and extremely well
attended, notwithstanding blackout
and other difficulties. It was desired
to have an increased number of
lectures in the evenings, but lighting
restrictions had militated against
this. Nevertheless, at such evening
meetings as had been held the attend-
ance had been very good, and a
continuance of good lectures and
attendances was looked for in the
future.

As President, he wished to pay
tribute to the loyal and hard work of

the Council. Of necessity it had been
called upon to appoint a good many
committees, and in all such cases the
work had been done expeditiously
and well. To the members of those
committees, as well as to the Mem-
bers of the Council, he expressed his
thanks and appreciation. He also
wished to thank his predecessor, Mr.
Mortimer, who had acted as his
guide and mentor during the past
year. As a comparative newcomer
to the administration of the Society,
he had found it necessary to lean on
someone with experience, and it
had been Mr. Mortimer as well as the
two Secretaries who had helped him.

The Balance Sheet also was a
cause for congratulation. Not only
were the finances in sound shape, but
they had been enhanced by a legacy
of \$5,000 bequeathed to the Society
in the will of the late Mr. Pirie

Vice-Presidents: H. Baines (267); J. Tritton (244).

Hon. Treasurer: R. H. Lawton (unopposed).

Ordinary Members of Council: J. Bull (333); J. H. Coote (302); E. Dent (223); Percy W. Harris (387); G. E. W. Herbert (270); J. Midgley Illingworth (328); J. Dudley Johnston (375); H. Bedford Lemere (161); Rosalind Mangot (210); Arthur S. Newman (381); J. H. Pledge (252); Ronald Procter (148); S. Schofield (239); Hugo van Wadenoyen (180); G. C. Weston (302).

The PRESIDENT, in acknowledging his re-election, said that he made no disguise of the fact that he was happy to assume the office for the second year, because he felt that in a job of this kind it was impossible to give one's best efforts during the first year of office. It was quite certain that there were many changes which

would have to be put into effect before everything was brought into proper order in the Society. These had been discussed in the Council and many of them were already under way. He hoped that during this coming year they would go on towards completion and make the Society even more efficient than it was at present.

On the motion of Mr. T. H. B. Scott, seconded by Mr. F. J. Mortimer, a vote of thanks was accorded to the Secretaries.

The SECRETARY then read Article of Association No. 77.

Mr. F. J. Tritton proposed, and Mr. J. H. Pledge seconded, "That Messrs. Calder-Marshall, Hutson and Bound be, and they are hereby re-elected auditors of the Society, with an honorarium of twenty guineas."

This was carried unanimously, and there being no more business, the meeting terminated.

Eric J. Hosking (Fellow), A. Saunders (Fellow).

Section E. (Kinematography): Messrs. J. Chear (Fellow), R. H. Cricks (Fellow), A. S. Newman (Hon. Fellow), S. Schofield (Fellow), G. C. Weston (Hon. Fellow).

Sections F, G, H. (Scientific Photography, including Photomicrography, Astronomical, Meteorological, Medical, X-Ray Work, etc. Scientific Research on photographic subjects. Work on photography of a definitely educational character): Messrs. H. Baines (Fellow), L. V. Chilton (Fellow), J. H. Pledge (Fellow), F. F. Kenwick (Hon. Fellow), C. Waller (Fellow), G. A. Jones (Fellow).

Section J. (Photo-Engraving): Messrs. A. J. Bull (Hon. Fellow), F. W. Coppin (Fellow), A. E. Dent (Fellow).

Convener: J. Dudley Johnston (Hon. Fellow).

Exhibition Organising Committee

The Members of the Council.
Convener: The President.

Lectures Committee

Messrs. A. J. Bull (Hon. Fellow), E. R. Davies (Fellow), P. W. Harris (Fellow), G. B. Harrison (Fellow), J. Dudley Johnston (Hon. Fellow), F. J. Mortimer, C.B.E. (Hon. Fellow), A. S. Newman (Hon. Fellow), E. J. Tritton (Fellow), J. H. Coote (Fellow), S. Schofield (Fellow).

Convener: The Secretary.

House Exhibitions Committee

Messrs. J. H. Coote (Fellow), Percy W. Harris (Fellow), J. Dudley Johnston (Hon. Fellow), R. H. Lawton (Hon. Fellow), Mrs. R. Mangot (Fellow), Messrs. F. J. Mortimer, C.B.E. (Hon. Fellow), A. S. Newman (Hon. Fellow).

Convener: The Secretary.

Hurter and Driffeld Memorial Fund Committee

Messrs. H. Baines (Fellow), Olaf Black (Hon. Fellow), R. E. Crowther (Fellow), G. B. Harrison (Fellow).

Convener: The Secretary.

Trall Taylor Memorial Fund Committee

London Members: Messrs. (1940) L. V. Chilton (Fellow), (1942) E. R. Davies (Fellow), (1942) A. E. Dent (Fellow), (1941) G. B. Harrison (Fellow), (1943) G. E. W. Herbert (Fellow), (1940) James Mitchell (Fellow), (1942) F. J. Mortimer, C.B.E. (Hon. Fellow), (1943) J. H. Pledge (Fellow), (1939) D. A. Spencer (Hon. Fellow), (1941) E. J. Tritton (Fellow).

COUNCIL MEETINGS

A MEETING of the Council of The Royal Photographic Society was held at 16, Prince's Gate, S.W.7, on March 16th, 1943, when the following were present: The President, Mr. D. McMaster, in the chair; Messrs. H. Baines, G. Scott Buske, L. V. Chilton, J. H. Coote, Percy W. Harris, G. E. W. Herbert, T. Midgley Illingworth, J. D. Johnston, R. H. Lawton, H. Bedford Lemere, F. J. Mortimer, Arthur S. Newman, J. H. Pledge, Ronald Procter, S. Schofield, F. J. Tritton, Hugo van Wadenoyen, and G. C. Weston.

Appointment of Officers

The following appointments were made:—

Honorary Solicitor: Mr. F. C. Boyes (Fellow).

Honorary Advisory Editors of the "Journal":

Scientific and Technical Section: Mr. C. Waller (Fellow).

Pictorial Section: Mr. J. Dudley Johnston (Hon. Fellow).

Kinematograph Section: Mr. A. S. Newman (Hon. Fellow).

Editor of the Journal: Mr. H. H. Blacklock (Fellow).

Hon. Secretary: Mr. J. Dudley Johnston (Hon. Fellow).

Hon. Curator of Prints: Mr. J. Dudley Johnston (Hon. Fellow).

Hon. Librarian: Mr. A. E. Cummins.

Representatives of the Council to the Executive Committee of The Photographic Alliance

Messrs. F. J. Mortimer, C.B.E. (Hon. Fellow), G. E. W. Herbert (Fellow), Thomas H. B. Scott (Hon. Fellow).

Representatives of the Council to the Executive Committee of The Central Association of Photographic Societies

Messrs. Percy W. Harris (Fellow), F. J. Mortimer, C.B.E. (Hon. Fellow), G. C. Weston (Hon. Fellow).

Associateship and Fellowship Admissions Committee

Section A. (Pictorial): Messrs. J. Dudley Johnston (Hon. Fellow), R. H. Lawton (Hon. Fellow), F. J. Mortimer, C.B.E. (Hon. Fellow), Ronald Procter (Fellow), Thomas H. B. Scott (Hon. Fellow), G. C. Weston (Hon. Fellow).

Section B. (Commercial, Advertising, Press and Record Photography): Messrs. A. J. Bull (Hon. Fellow), Percy W. Harris (Fellow), A. J. Clifton.

Section C. (Colour Photography): Messrs. G. Scott Buske (Associate), F. J. Tritton (Fellow), J. H. Coote (Fellow).

Section D. (Natural History Photomicrological, etc.): Messrs. C. G. Pike (Fellow), E. A. Robins (Hon. Fellow),

Secretary: Mr. A. J. B. (1941-1942)
 C. W. Bentley (1940-1941)
 Hon. Fellow (1942-1943)
 C. W. Bentley (1940-1941)
 J. Crother (Fellow) (1941-1942)
 C. W. Bentley (1942-1943)
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 C. W. Bentley (1942-1943)

Convener: The Secretary.

"Journal" Committee

Members: A. J. B. (1941-1942)
 W. H. Bentley (1940-1941)
 Hon. Fellow (1942-1943)
 C. W. Bentley (1940-1941)
 J. Crother (Fellow) (1941-1942)
 C. W. Bentley (1942-1943)
 C. W. Bentley (1941-1942)
 C. W. Bentley (1942-1943)

Convener: The President.

Finance Committee

Members: H. B. Bentley (1941-1942)
 Midgley (Fellow) (1940-1941)
 Hon. Fellow (1942-1943)
 C. W. Bentley (1940-1941)
 J. Crother (Fellow) (1941-1942)
 C. W. Bentley (1942-1943)
 C. W. Bentley (1941-1942)
 C. W. Bentley (1942-1943)

Convener: The Secretary.

House Committee

Messrs. J. Dudley Johnston (Hon. Fellow), G. B. Bentley (Hon. Fellow), R. H. Laxton (Hon. Fellow), Mrs. R. Mangot (Fellow), Messrs. F. J. Mortimer, C. B. Bentley (Hon. Fellow), Thomas H. B. Scott (Hon. Fellow), G. C. Weston (Hon. Fellow).

Convener: J. D. Johnston (Hon. Fellow).

Library Committee

Members: L. A. Bentley (Fellow), J. H. Crother (Fellow), Dr. A. Bentley (Fellow), R. H. Laxton (Fellow), G. C. Weston (Fellow), Mr. G. E. Lockie, Messrs. J. H. Bentley (Fellow), R. S. Schultze, F. J. Linton (Fellow).

Convener: F. J. Linton (Fellow).

Museum Committee

Messrs. A. C. Banfield (Fellow), Alex. Banfield (Hon. Member), R. E. Crother (Fellow), F. E. Crother (Associate), J. Dudley Johnston (Hon. Fellow), A. J. Bentley (Hon. Fellow), J. H. Bentley (Fellow), R. S. Schultze, F. J. Linton (Fellow).

Convener: F. J. Linton (Fellow).

National Buildings Record (R.I.B.A. Committee)

Representatives: F. J. Linton, C. B. Bentley.

British Standards Institution Apparatus and Materials Standardisation Committee

Representatives: Messrs. F. J. Linton, C. B. Bentley, A. J. Bentley.

British Standards Institution Photographic Industry Committee

Representatives: Messrs. H. Bentley, C. B. Bentley, A. J. Bentley.

Honorary Foreign Corresponding Members of Council

Members: Mr. L. A. Bentley (Fellow), Mr. C. B. Bentley (Fellow), Mr. A. J. Bentley (Fellow), Mr. R. H. Laxton (Fellow), Mr. F. J. Mortimer (Fellow), Mr. C. B. Bentley (Fellow), Mr. Thomas H. B. Scott (Fellow), Mr. G. C. Weston (Fellow).

Standing Orders

1. The Council shall meet on the second Monday in every month during the Session, or at such other times as the President may determine.

There shall be published in the *Journal* as soon as possible after each Meeting, under the heading "Council Meeting," a statement of such business done at the Meeting as the Council shall direct, including the following: The date of the Meeting; the names of the Chairman and the Members present; the Standing Orders adopted or any revision of them; the composition of any Committee that the Council may appoint; the names and addresses of candidates nominated for Membership; the names of those admitted to the Associateship and Fellowship, with the number of applications received; the name of any Honorary Fellow or Honorary Member elected; and the titles of the Societies admitted to Affiliation.

(2) The Council shall vote only upon such questions as may be specifically set forth in the agenda accompanying the notice of Meeting, excepting the following items, which shall be held to be sufficiently indicated by the term "general business," viz.: (a) The reading of the Minutes of the previous Meeting; (b) the passing of the nominations of Candidates for Membership and applications for affiliation, the election of Members (which shall be by show of hands, after discussion, if necessary), and the notification of resignation; (c) the receiving of presents; (d) the passing of accounts for payment; and (e) the reading of letters. It shall be in order to propose that any matter is urgent, and if two-thirds of those present vote in favour of urgency, that matter shall be considered in the same way, as if due notice had been given.

(3) The President shall be a member, *ex-officio*, of all Committees except the Associateship and Fellowship Admissions Committee. The President shall be a member of the Permanent Committee of the Council, and shall be a member of the Council of the Committee of the Council, and shall be a member of the Council of the Council.

(4) Lecturers and readers of papers and addresses shall be informed that the Society requires first publication of their communication and also the previous submission of such communication unless special exception be made by the Council.

(5) Smoking shall be permitted in the Society's House except in the Meeting Room.

(6) Cheques upon the Society's Bankers shall be signed by the Honorary Treasurer and the Secretary of the Society, or the President and the Secretary of the Society.

(7) Legal documents and the Seal of the Society shall be kept in the Society's safe in charge of the Honorary Treasurer. The Seal shall not be affixed to any document except by special resolution of the Council, and shall be attested by the President and Secretary or other officers appointed by the Council in their absence.

(8) Any Member desiring to inspect the Society's books of accounts shall give notice of such desire to the Secretary, who shall report the same to the Council at its next Meeting. The Council shall thereupon give directions as to the time and place for such inspection, and such direction shall forthwith be communicated by the Secretary to the Member desiring the inspection.

(9) a. The election of Honorary Fellows and Fellows admitted by the Council under Articles 11 and 12 of the Articles of Association and Honorary Members (Class A) shall be conducted in the following manner. Notice of a proposal shall be given on the agenda accompanying the notice calling the Meeting of Council at which such proposal is to be made. The names of the nominated Honorary Fellows shall not appear on the agenda paper. The proposal, if duly seconded, shall be discussed at such Meeting, and shall be voted upon by ballot at the Meeting of the Council next following. The nominee shall not be elected unless three-fourths or a larger proportion of the recorded votes are in favour of the election. Honorary Fellows shall be asked to present their portrait to the Society's collection.

A Member applying for reinstatement in the Fellowship or Associateship may be reinstated if fourths or a larger proportion recorded votes are in favour of instatement. Notice of such action must appear on the agenda of the Meeting sent to Members of the Council. The motion shall be voted at one Council Meeting held upon at the Council Meeting next following.

a. Applications for the Fellowship will be received only from Ordinary Members of the Society. Such applications shall be considered and reported upon to the Council by a Committee appointed to consider the qualifications of the candidates. The report of the Committee, together with the applications, shall be presented at the Council Meeting next following, and voted.

No Candidate shall be admitted to the Associateship or Fellowship unless three-fourths or a larger proportion of those Members present vote, by show of hands, in favour of the election. The report of the Committee and Fellowship Admissions Committee shall be published in the *Journal*.

The Committee shall consist of three members of the Society, who shall be elected by the Council annually. Different branches of Photography shall be represented as follows:

Pictorial Photography, including Portraiture, six members; Commercial, Advertising, Press and Journal Photography, three members; Natural History (Animal, Botanical, Geological, etc.), four members; Scientific Photography, five members; Microphotography (including Microphotography, Aerial Survey, Medical, Meteorological, Medical-Ray work, etc.), Scientific Photography of Photographic subjects, Work on Photography of a definitional character, six members.

Photo-Engraving, three members. Each section shall vote separately on the claims of the applicant; its recommendation, if any, shall be reported for the Council. Elections of Associates and Fellows shall take place at the Council Meetings in May and November. Applications accompanied by all necessary evidence shall be received before the first of the preceding month.

Applications shall be made in the form provided for the purpose. Candidates will be required to submit evidence of their qualifications in accordance with the regulations.

c. A certificate, under the Seal of the Society, will be issued to all Candidates who may be admitted to the Associateship and Fellowship.

(11) The Council may consider annually the award of one silver Progress Medal. The Progress Medal may be awarded in recognition of any invention, research, publication or exhibition which, in the opinion of the Council, shall have resulted in any important advance in the development of photography. The award shall be conducted in the following manner: (a) At its November Meeting the Council shall receive the names of nominees, duly proposed and seconded by any two Members of the Society, and the nominators shall hand in a written statement of the special work for consideration; (b) at its December Meeting the Council shall discuss the work of the nominees as set forth in the proposals, and shall ballot out the names until only one remains; (c) at its January Meeting the Council shall, after discussion, vote openly upon the question of the award. The medal shall not be awarded unless three-fourths or a larger proportion of the recorded votes are in favour of its bestowal. Recipients of the Progress Medal shall be asked to present their portraits to the Society's collection. These regulations, with the names of those who have received the Medal and a statement of the reasons for the award, which statement shall be drafted by the Council, shall be published in the *Journal*.

(12) Members of the Society having formed themselves into groups for the special encouragement of (a) Scientific and Technical photographic work, (b) Pictorial photographic work, (c) Kinematography, (d) Colour photography, and (e) Miniature Camera photography, and having applied to the Council for recognition of such Groups in order to assist the Council in the work and aims of the Society, the said Groups are empowered to carry on their work under the rules approved by the Council for that purpose.

(13) The Council may nominate a member of each Committee to be the convener, who shall be responsible for the conducting, conduct and reporting of that Committee.

Honorary Fellowship

It was unanimously resolved that the Honorary Fellowship of the Society be conferred upon Mr. Cecil M. Hepworth in recognition and appreciation of his distinguished services to Kinematography, and upon Mr. G. C. Weston in recognition and appreciation of his distinguished

services to Photography and to the Society.

A further Meeting of the Council was held at 16, Prince's Gate, S.W.7, on April 12th, when the following were present: The President, Mr. D. McMaster, in the chair; Messrs. H. Baines, A. J. Bull, G. Scott Bushe, L. V. Chilton, A. E. Dent, F. Green, Percy W. Harris, G. E. W. Herbert, T. Midgley Illingworth, J. D. Johnston, H. Bedford Lemere, Mrs. Rosalind Maingot, Messrs. F. J. Mortimer, Arthur S. Newman, J. H. Pledge, Ronald Procter, S. Schofield, Thomas H. B. Scott, W. Symon (Col.) F. J. Tritton, and G. C. Weston.

New Members

The following Candidates were nominated for Membership:

John Southam Abbott, 45, Church Avenue, Pinner, Middlesex. (Member, Association of Cine Technicians).

Orval W. Allen, 137, Sellars Avenue, Toronto, Ontario, Canada.

Erich Auerbach, Flat 167, 20, Abercorn Place, St. John's Wood, N.W.

George Graham Aylward, 106, High Street, Knaresborough, Yorks.

Bradford K. Bradrach, c/o Bachrach, Inc., Newton, Mass., U.S.A.

Reginald F. Beck, "Phillipsote," Bengeworth, Evesham, Worcs.

Harold Stanley Becke, "Heston," 59, Ashley Road, South Shields. (Member, South Shields Photographic Society).

Vera Colton Beckett (Miss), 57, Queen's Road, Southport. (Member, Southport Photographic Society).

Thomas H. Berry, The Hon. Irish Society's School, Culmore, Londonderry. (Member, City of Derry Camera Club).

Peter Bouzeville Binns, 22, Greencluse Road, Ilfracombe.

Maurice S. Bishop, Fourwinds, Hardwick Road, Stretey, Stalls. (Member, Sutton Coldfield Photographic Society).

Laurence W. Blaker, Studio Royal, 1292 Moto, Manhattan, Kansas, U.S.A.

Cedric Langley Brightman, The Laureate, 40, Tithe Barn Road, Staffs. (Member, Stafford Photographic Society).

Stanley A. Carr, 65, Arden Road, Tottenham, S.E.9. (Member, South Square Photographic Society).

Hans G. Casparius, c/o Spectroscopic Co., 50-51, Wardour Street, W.

Emily Mary Cattermole, 21, The Grange, Nutfield Road, Reigate.

Archibald Benjamin Chubb, c/o The Camera Club, Park Avenue, Leeds 10. (Member, Leeds Camera Club).

George William Avery Clouston, c/o The Camera Club, Stapleford, near Loughborough.

Arthur Constantine Cook, c/o The Camera Club, Lingen, Rosendun, Kent.

Jack Curtis, 102, Colindale Avenue, N.W.9, Bristol 5. (Member, Bristol Photographic Society).

Otto Kemna Dose, 37, Castle Street, Cape Town. (Member, Cape Town Photographic Society).

Gordon Douglas, 15, Rollo Street, Cyrildene, Johannesburg. (Member, Johannesburg Photographic Society and Johannesburg Camera Club).

Robert Stephens Duncan, 5, Brookvale Drive, Belfast.

C. Raycraft Elliott, 160, Peachtree Street, Atlanta, Georgia.

Joseph Sudbury Fisher, F.I.S.Ch., Red House, Church Street, Dronfield, Sheffield. (Member, Photographic Postal Portfolio).

William Foster, 20, Appleton Crescent, Willington, Co. Durham. (Member, Bishop Auckland Photographic Society).

Rex Dunbar Frazier, P.O. Box 36, Houston, Texas, U.S.A.

Shiva Gopal, M.Sc., I.L.B., 10, Cantonment Road, Lucknow, India.

Isidore Greenfield, B.Sc., A.I.C., F.C.S., 7, Norwood Avenue, Newcastle on Tyne 6.

Gulamudi Habib, Habib Mansions, Warden Road, Bombay, India. (Member, The Photographic Society of India).

Alec. Norman Hainsworth, 44, Buckingham Avenue, Scunthorpe, Lincs. (Member, Scunthorpe Camera Club).

Charles Harris, 64, Island Road, Handsworth, Birmingham 21. (Member, Handsworth Photographic Society).

Maurice Lawrence Haselgrove, 18, Maiden Castle Road, Dorchester. (Member, Dorchester Camera Club).

Phillip Sidney Hillard Henry, 4, Beechway, Knutsford Road, Wilmslow, Manchester. (Member, Manchester Amateur Photographic Society).

Henry Thomas Heywood, 53, Orton Road, Carlisle. (Member, Carlisle Camera Club).

Robert R. Hoare, O.B.E., R.N. (Retired), (Paymaster-Captain), United Services Club, 110, Pall Mall, London, S.W.1.

William Edward Hudson, 38, Oaklands Road, Wolverhampton.

Lloyd A. Jones, Building 59, Kodak Park, Rochester, New York.

Stanley Kirby Kellett-Smith (Capt. R.A.M.C.), 1, Lyplatt Terrace, Cheltenham.

James Cutlbert Lane, 1, Henry Street, North Shields. (Member, Tynemouth Photographic Society).

George Enoch Lowley, 28, Market Place, Wednesbury, Staffs.

Aubrey Harold Lealand, "Haseley," Wall Hill Lane, Corley Moor, near Coventry.

Virginia Leberman (Mrs.), 1306, Colorado Street, Austin, Texas, U.S.A.

Douglas Victor Lewis, 7, Richmond Road, Ipswich, Suffolk. (Member, Ipswich and District Photographic Society).

Harold Henry Lidstone, 29, Eaton Road, Branksome Park, Bournemouth.

John Francis McCloskey, B.B.A., P.Ph., M.B.A., New Orleans College of Pharmacy, Loyola of The South, 6393, St. Charles Avenue, New Orleans, Louisiana, U.S.A.

Robert L. McFerran, 816, Medical Art Building, Minneapolis, Minn., U.S.A.

Glenn Chadwick Melton, 1014 Stoneleigh, Dallas, Texas, U.S.A.

George Henry Midgley, M.Sc., F.G.S., 5, Brampton Gardens, Hershham, Walton-on-Thames, Surrey.

William Edward Miller, "Cohee," London Road, Basingstoke, Hants.

Burt Moritz, Carnegie Institution of Washington, Dept. of Terrestrial Magnetism, 5241, Broad Branch Road, N.W., Washington, D.C.

Charles Mundy, The Hermitage, Bancroft Road, Hale, Cheshire.

Cyril Bernard Pamment, 32, Arundel Gardens, Westcliff-on-Sea.

Kenneth George Alfred Pankhurst, Ph.D., A.I.C., Messrs. Ilford, Limited, Selo Works, Brentwood, Essex.

Walter Charles Leonard Parsons, Dallas, Edward Road, Dorchester. (Member, Dorchester Camera Club).

Adrianus Pijper, M.D., D.Sc., 57, Celliers Street, Pretoria, S. Africa.

P. G. Ratcliffe, The Warren, Avenue Road, Dorridge, Warwickshire. (Member, Birmingham Photographic Society).

Guy N. Reid, 1409, Summit Avenue, Fort Worth, Texas, U.S.A.

Cyril Wilfred Roberts, 2, High Street, High Wycombe.

Harry Charles Victor Rout, Room 54, Craigside, Llandudno, N. Wales. (Member, Inland Revenue Photographic Society).

Harold Edward Seth, 36, Stony Hill Avenue, Harrow Side, Blackpool. (Member, Blackpool and Fylde Photographic Society).

Timothy Francis Sheppard, "Capranica," 35, St. Finbarr's Park, Cork, Eire.

Z. R. M. Skulski, 101, Sussex Gardens, W.2.

Henry James Southern, 2, Weston Road, Handsworth, Birmingham.

William Stewart Taylor, Pierhead, Newport, Dundee.

Douglas de la Vars (Sergeant), 367, Bomb Squadron (H), 306, Bomb Group, A.P.O., 634, New York Post Master.

P. F. E. Weber (Corporal P-28033), Command Pay Detachment, R.C.A.P.C., Canadian Army Overseas, England.

Alfred Wild, 27, Hampton Road, West Bridgeford, Nottingham. (Member, Derby Railway Institute Photographic Society).

Irving Wilkinson, 24, Trinity Street, Huddersfield.

Hiram M. Willis, 1929, Dunstan Road, Houston, Texas, U.S.A.

Reginald Wilson, 1, St. Oswald's Road, Norbury, S.W.16. (Member, Croydon Camera Club).

Percy Robert Wood, 2, Bourne Avenue, Fenham, Newcastle on Tyne 4. (Member, Newcastle on Tyne Photographic Society).

George Albert Woods, 37, Wampool Street, Silloth, Cumberland.

Frank Clement Woodward, Moot End, Silkstone Common, Barnsley, Yorkshire. (Member, Stocksbridge Photographic Society and Sheffield Photographic Society).

Robert George Canham, 43, Kimberley Road, Lowestoft, Suffolk.

Joshua Harris, 7, Griffin Street, Salford 7.

Leslie George Huckle, 36, West Row, North Kensington, W.10.

Arthur Thackray Ingham, "Ashville," 2, Elm Gardens, Cleethorpes, Lincolnshire.

Harry Smith, 22, Brunswick Square, Liverpool.

The Candidates who were nominated at the Meeting of the Council held on March 8th (see p. 161, April issue, this *Journal*), were elected to Membership.

The Council regretted to learn of the death of Mr. John White (Member), President of The Photographic Alliance, which occurred suddenly on March 23rd.

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I. B. M. Lomas (Associate); our prints for the Permanent on from Dr. D. A. Spencer (Fellow), per Mr. J. Dudley n (Hon. Fellow); two by the late Mr. Leo A. Fellow) for the Permanent on, per Mr. Percy W. Harris; a copy of "The Story of

Hansel and Gretel," represented by dolls and photographed in natural colours. Illustrations by George A. Adams. Colour photography by Paul Henning. For the Library, from Mr. Paul Henning (Member).

A number of early stereoscopic transparencies for the Museum, from Miss H. F. M. King (Member).

detailed discussion will be left to the Treasurer's Report. The Committee feel, however, that the Group should be grateful for the energy which our new Treasurer has put into the work, and also to our Honorary Auditors, who have given him freely of their valuable advice and assistance.

THE SOCIETY'S GROUPS

ANNUAL GENERAL MEETINGS

SCIENTIFIC AND TECHNICAL GROUP

Annual General Meeting

The Annual General Meeting of the Scientific and Technical Group was held on Tuesday, March, 1943, with Mr. F. J. (Fellow) in the chair.

SECRETARY (Dr. G. B. Harri- and the Annual Report.

Report of the Committee for 1942

MEETINGS

Considerable difficulty is experienced in arranging Group Meetings these times, partly because we have suitable papers for discussion are too busy with more important matters or are bound for other reasons. It is also difficult to find suitable times for meetings in the middle of winter one has to meet early in the afternoon travel home during the day, yet Saturday afternoons are unpopular because they seriously curtail the only free time available by most members these days. Meetings, however, were held during the year, of which two were held as joint meetings with the Society of Physics.

The first meeting was held on Tuesday, 24th February, when Mr. Davies gave a lecture on "The Photography in the Detection and Measurement of Radiation," which was arranged jointly with the Society of Physics. The lecture was held at 18, Prince's Gate, and was attended by members of both Societies. This was followed on Tuesday, April, by our Annual General Meeting, after which Mr. L. V. gave a paper on "The Controlling Capacity of Photographic Papers."

During the summer recess a different meeting was attempted. This was arranged in close collaboration with the Industrial Radiology Group, the Institute of Physics, and was a symposium on "The Photographic Aspects of Industrial Radi-

ology." At this meeting four papers were read, and free discussion was held. The programme was as follows:

1. "Film Shrinkage in X-ray Analysis," by H. P. Rooksby, B.Sc., F.Inst.P.
2. "Dependence of Photographic Sensitivity on X-ray Quality," by E. E. Smith, B.Sc., A.Inst.P.
3. "The Sensitometric Estimation of Radiographic Exposures," by G. F. G. Knipe, B.Sc.
4. "Some Fundamentals in the Processing of X-ray Film," by R. H. Herz, Dr.Phil.Nat., F.Inst.P.

This meeting was held on Saturday afternoon, 21st November. It was well attended, by members of both Groups, and can be described as a very successful meeting.

PHOTOGRAPHIC ABSTRACTS

The publication of "Photographic Abstracts" has continued, though the issue of parts has been somewhat delayed. It will be realised that the difficulties in the way of prompt issue of these are now considerable. In order to assist matters, the Committee, half way through the year, appointed Mr. V. Gallafent as Assistant Editor. This step has proved of great value to our Editor, Mr. L. V. Chilton, and much credit is due to them for the way in which they have been able to carry on under present conditions. The Committee would make it clear that both they and the Editor are determined to continue publication, and look upon these difficulties as ones which must be overcome. One of the greatest restrictions which is engaging our attention at the moment is that of paper, and many possible ways of economising have been freely discussed by the Committee during the year. Some of these are already bearing fruit, and others are under active consideration.

GROUP FINANCES

The Committee is satisfied that the finances of the Group are sound, and

WILLIAMSON AND HENDERSON RESEARCH AWARDS

In accordance with the usual procedure, the Committee considered papers published in the photographic literature, and made an award under the terms of the Williamson Photographic Research Award as follows:—

£30 0s. 0d. to be divided equally between the three authors for their paper on "Latent Image Distribution," by W. F. Berg, A. Marriage and G. W. W. Stevens, *P.J.*, Sept., 1941, pp. 413-421.

In addition to this, the Committee has considered an application which, though covered by the terms of the grant, was of a nature with which the Committee has not previously had to deal. Application was made by Mr. J. H. Coote for the loan of equipment for carrying out certain specific research. The purchase of the equipment was agreed by the Committee, and is on loan to Mr. Coote for the purpose of carrying out his research work.

The question of the Henderson Award was raised by the Council during the year, and the administration of this Award has now been officially handed over to the Scientific and Technical Group. Though the matter has been considered in detail by the Committee, and a statement has been published in *The Photographic Journal*, no award has yet been made. The matter, however, will be dealt with in 1943.

GROUP MEMBERSHIP

Since the beginning of the war, it has been reported annually that the Group membership has been decreasing slowly. It will be realised that in these times it is extremely difficult to keep track of some of our members, but during the year the Treasurer has made a strenuous effort to arrive at the true membership position, and has compiled a membership register.

This register consists of all those members who paid their Group subscription for the year 1940, and who have not since officially resigned, plus any new members who have joined the Group since 1940. On this basis the membership position as at January 1st, 1943, was as follows:—

Paid-up subscriptions for 1942	295
Subscriptions suspended (Members known to be on active service)	8
Unpaid subscriptions for 1942	49
Total	352

Eighty-seven new members have been enrolled during 1942, while J. Rheinberg has died and H. C. Tilzey and F. H. Wilding resigned at the end of the year.

This represents a considerable increase in membership during the year, and is reflected by the growing membership of the Society as a whole. *March 30th, 1943.*

The TREASURER (Mr. Ronald J. Cox), in presenting the Income and Expenditure Account and Balance Sheet, said that the accounts this year called for some explanation, as they were in a rather different form from usual. For some time the Committee had felt the need for giving rather more explanation of the financial working of the Group, and the change in the Treasurership seemed a good opportunity to make other changes considered desirable. Consequently, he was presenting for the approval of the meeting not only an amplified Income and Expenditure Account, but a Balance Sheet showing the assets and liabilities, and the true financial position of the Group. In drawing up the accounts, he had also taken the opportunity of re-grouping certain items to show more clearly the exact cost of producing "Photographic Abstracts" and the income derived from them.

With regard to the Income and Expenditure Account, the item of £175 18s. 8d. for printing was £23 up on the previous year. This was due not only to the increased cost of printing, but to a very considerable increase in the number of "Abstracts" printed; correspondingly the Abstractors' Fees showed an increase of £37. Editorial salaries were up by £25, this representing six months' salary for the Assistant Editor, appointed half-way through the year. On the Income side, the income from Group subscriptions was nearly £30 up, due to the large influx of new members. The donations were almost identical with those for the previous year, and again the Committee wished to express its thanks to all those firms who had supported them during the year. Without their help the production of "Photographic Abstracts" would be financially impossible. The list of donations included \$100 received last year from Dupont de Nemours & Co., too late

for inclusion in the 1941 accounts. The excess of Income over Expenditure on the year's working was £77.

Turning to the Balance Sheet, it would be seen that £34 odd had been transferred from the Income and Expenditure Account to the Reserve Account, to bring the latter up to £200. This £200, plus the £270 odd in the Income and Expenditure Account, making £470 odd, represented the Capital of the Group. £225 had been invested in National Savings Certificates, which were being held in trust for them by the Society. The Group held a large stock of "Photographic Abstracts," which were of great potential value, and they had been included in the Balance Sheet at a purely nominal value.

Superficially, the £77 excess on the year's working appeared to be an excellent result, but it should be realised that if there had been a further £25 for editorial salaries (as there would be this year), and if they had not received £62 occasional income from the sale of back sets of the "Abstracts," that £77 would have been wiped out. There was, therefore, no ground for complacency. The £470 odd capital appearing in the Balance Sheet appeared to be quite a substantial sum, but between £200 and £300 would be required for the second Index as soon as that could be produced, and they were already two years on towards the third Index.

However, despite these somewhat disturbing remarks, he considered that the financial position of the Group was stronger than at any time in its history, the membership was higher than it had ever been before, and the record number of new members looked like being surpassed this year. These were solid grounds for sober confidence, but not for complacency. They could never afford to be complacent about the Group's financial position as long as the production of "Photographic Abstracts" were only possible through the continued support of donors on whom they relied for 50 per cent of their income.

The SECRETARY read the Auditors' certificate.

The CHAIRMAN said that, arising out of the certificate, the Honorary Auditors were not appointed by the last Annual General Meeting, as they should have been, but by the Committee during the course of the year. To put the matter in order, he would like someone to move the ratification of the appointment of the Honorary Auditors for the year 1943.

Mr. READ proposed and Mr. RENWICK seconded, the ratification of the appointment of the Auditors, and this was carried.

The adoption of the Annual Report and the Income and Expenditure Account and Balance Sheet, was moved and seconded. The MOVIE said that it was a most lucid report of the income and expenditure of the Group, and he thought the Treasurer was to be congratulated on his presentation of the accounts.

Mr. F. F. RENWICK said that he had been associated with the Group since its earliest days, and it gave him great pleasure to hear such an able account of its affairs. When he looked back to the state of the Society during the last war, and then found that during this second great war the affairs of the Society were prospering and the Group was doing even better, he felt very proud. The Society had really become a wonderful federation of photographic interests, which spoke volumes for the progress of photography in this country. He had always thought the Scientific and Technical Group was the life-blood of the Society: he supposed that that was a matter of opinion, and that those who were not so interested in the scientific side would not agree, but it gave him great pleasure tonight to hear such an excellent report.

The motion for the adoption of the Annual Report and the Income and Expenditure Account and Balance Sheet was put and carried.

The CHAIRMAN said that the Group had not previously had an official chairman. It had elected its own chairman, sometimes for a period, and sometimes changing from meeting to meeting by requesting suitable people to fill the office. The Committee now felt that the position was a bit anomalous, and that it would be a good idea to have a permanent chairman. This would have the advantage that, with the officers of the Group, it would increase the committee by one, and would give greater continuity to the conduct of meetings. He therefore wished to move formally, from the Chair, that the office of chairman of the Group be created.

The motion was put and carried unanimously.

Election of Officers and Committee

The CHAIRMAN said the next business was the election of Officers of the Group, Committee and Honorary Auditors. This year it was proposed to have a ballot, for which nominations had already been received, and further nominations would be in order at that meeting. Three officers were required, namely, Chairman, Treasurer, and Secretary, and a Committee of six. The present

Income and Expenditure Account for the Year ended 31st December, 1942

EXPENDITURE	£	s.	d.	£	s.	d.	Cr.	INCOME	£	s.	d.	£	s.	d.			
ues—Photographic Abstracts, Pta. 1 to 4—							By Subscriptions—Group Membership—										
... ..	175	18	8				For Year 1941					1	2	0			
ns Fees	74	10	11				For Year 1942					110	5	0			
Editor and Asst. Editor ...	125	0	0										111	7	6		
of Patent Specifications, 1942	9	10	0				DONATIONS—										
t in respect of Year 1941 ...	6	17	0				For Year 1941 received during 1942					24	14	8			
							For Year 1942 received during 1943					214	1	0			
														238	15	8	
Expenses	14	7	0				Photographic Abstracts— Receipts from										
				392	0	7	Subscriptions, Sales, Advertise-										
nd Stationery				8	16	11	ments, etc.—										
nd Sundry Expenses ...				8	14	0	Subscriptions—Year 1941 ...			2	5	0					
ding Excess of Income over							Year 1942 ...			41	15	0					
iture for the Year ...				77	0	7						44	0	0			
							Sales of back issues					62	10	0			
							Advertisements—Year 1941			15	4	3					
							Year 1942			15	3	0					
												80	7	8			
														136	17	3	
							Bank Interest							1	2		
				£487	1	7									£487	1	7

Balance Sheet, 31st December, 1942

LIABILITIES				ASSETS			
	£	s.	d.		£	s.	d.
editors and Reserves				Investment at Cost—			
... ..				300 National Savings Certificates at 15s. each			225 0 0
... ..				(Held by The Royal Photographic Society			
... ..				of Great Britain, on behalf of the Scientific			
... ..				and Technical Group)			
... ..				Stock—			
... ..				Copies of <i>Photographic Abstracts—</i>			
... ..				<i>Nominal Value</i>			1 0 0
... ..				Sundry Debtors—			
... ..				The Royal Photographic Society of Great			
... ..				Britain... ..		12 8 9	
... ..				Outstanding Accounts		17 17 0	
... ..							30 6 8
... ..				Donations for Year 1942, received during 1943			214 1 0
... ..				Cash at Bank and in Hand			176 15 7
... ..							£647 2 10
... ..							£647 2 10

(Signed) F. J. TRITTON, *Chairman.*RONALD J. COX, *Hon. Treasurer.*

AUDITORS' REPORT TO THE MEMBERS

... to the members that we have examined the foregoing together with the books of the Scientific and Technical Group ... together with the books of the Group.

best of our information and the explanations given to us, and as shown by the books of the Group.

(Signed) CECIL JEFFERIS, *Incorporated Accountant.*HAROLD JEFFERIS, *Incorporated Accountant.*

23 Roden Street, Ilford, Essex.

Hon. Auditors.

10th March, 1943.

Income from Firms in the Photographic and Allied Trades for the year ending 31st December 1942

				£	s.	d.					£	s.	d.
The Company Ltd.				2	2	0	G. Nelson, Dale and Co. Ltd.				2	2	0
Pont de Nemours & Co. (1941) ...				24	14	8	Norton and Gregory Ltd.				1	1	0
				(100 Dollars)			Ozalid Co. Ltd.				5	5	0
and Sons Ltd.				10	10	0	C. Simeons and Co. Ltd.				2	2	0
Ltd.					5	0	Smethurst High-Light Ltd.				3	3	0
and Williams Ltd.				3	3	0	Taylor, Taylor and Hobson, Ltd. ...				10	10	0
Ltd.				100	0	0	W. Watson and Sons Ltd.				5	5	0
and Sons' Smelting Works Ltd. ...				5	5	0	Wiggins, Teape and Co. (1919) Ltd. ...				5	5	0
Ltd.				50	0	0							
Bull and Spencer Ltd.				3	3	0							
											£238	15	8

March, 1943.

Committee consisted of Selwyn, Horner, Waller, Eyles, Hopkinson and himself. It was customary for two members of the Committee to retire annually, but this year three had decided to retire, namely, Selwyn, Horner and Waller. The other three were open for election, and had been nominated. The nominations were as follows:

Chairman: Dr. H. Baines.

Treasurer: R. J. Cox.

Secretary: G. B. Harrison.

Committee: F. H. Brittain, E. D. Eyles, V. G. W. Harrison, R. G. Hopkinson, E. C. Hunter, G. A. Jones, H. D. Murray, J. Reindorp, F. J. Tritton, E. L. Turner.

A ballot was taken, as a result of which the following were elected:—

Chairman: Dr. H. Baines.

Treasurer: R. J. Cox.

Secretary: G. B. Harrison.

Committee: E. D. Eyles, V. G. W. Harrison, R. G. Hopkinson, G. A. Jones, H. D. Murray, F. J. Tritton. On the motion of Mr. CHILTON, seconded by Mr. S. READ, Mr. Cecil Jefferis and Mr. Harold Jefferis were re-elected Honorary Auditors.

On the motion of Mr. F. F. RENWICK, a vote of thanks was accorded to the Officers and Committee for their services during the past year.

Mr. CHILTON then gave some account of his stewardship as Editor of "Photographic Abstracts." He said that they were allowed to use only 30 per cent of the paper used before the war. In view of the increasing membership of the Group, this created great difficulties. It was desired to do nothing which would impair the quality of their publication. Ultimately, it was decided to endeavour to get members to share their copies, and to withhold sending copies to any members of the Group who, while remaining members did not wish to receive a copy. Some 65 out of 300 said that they could do without "Photographic Abstracts," but the saving in that respect early last year was almost immediately written off by the increase of membership. After further consideration he moved that:

"That subject to the approval of the Council, commencing 1st January, 1944, the subscription to the Scientific and Technical Group be 5s. 0d. per annum, members having the option of receiving 'Photographic Abstracts' for an additional subscription of 7s. 6d. per annum."

Mr. HORNER seconded.

Mr. RENWICK criticised the proposal, and urged that it should only be a temporary war-time measure.

Mr. READ said that if they were forced to reduce the circulation of

"Photographic Abstracts" it seemed to him that the obvious thing to do would be to increase the Group subscription.

Dr. BAINES considered it a most undesirable policy to raise the subscription so that the impecunious would be squeezed out.

Mr. CHILTON signified his willingness to accept an amendment: "That it be an emergency measure, and subject to the approval of the Council, etc."

Mr. HORNER, the original seconder, however, found himself unable to agree, and eventually the resolution was proposed by Mr. E. R. DAVIES, and seconded by Dr. BAINES, and carried as follows:—

"That subject to the approval of the Council, and as an emergency measure, commencing 1st January, 1944, the subscription to the Scientific and Technical Group be 5s. 0d. per annum, members having the option of receiving 'Photographic Abstracts' for an additional subscription of 7s. 6d. per annum."

The CHAIRMAN announced that Mr. Chilton had been appointed to represent the Group on the Society's Council.

Dr. BAINES (Chairman of the Group) took the chair for the remainder of the meeting.

PICTORIAL GROUP Annual General Meeting

THE Annual General Meeting of the Pictorial Group of The Royal Photographic Society was held on Friday, March 5th, 1943, at 16, Prince's Gate, S.W.7, with Mr. THOMAS H. B. SCOTT, Hon. F.R.P.S., presiding.

The Hon. SECRETARY (Mr. Dudley Johnston) read the Minutes of the Annual General Meeting held on March 1st, 1942, which were confirmed and signed.

Annual Report and Accounts

The Hon. SECRETARY read the Annual Report.

At the opening of the year, the anticipation of further air raids, difficulties of travel and the fact that the Society's House was not thoroughly equipped with "black out," operated to restrict the activities of the Group in arranging their informal evening meetings. The Group, however, sponsored three of the Society's Saturday afternoon meetings, at the first of which Miss Margaret Bourke-White, of New York, spoke of her experiences in "Shooting the Russian War," at the second, in January last, Mr. Percy W. Harris (Fellow) gave much useful

and interesting information regarding "Exposure Meters and the P. Photographer," and at the last given on March 6th, Mr. L. Vining (Fellow) is to speak of "Way with the Miniature Camera."

As the year advanced the interest in photography increased, and widespread air raids developed. The Committee decided, in September, that the time had come when the meetings might be resumed. Finally, four meetings were arranged, two each in December and January. It was recognised that these were experimental, as it could not be foreseen to what extent attendance would be affected by all the factors attaching to war-time conditions. At the first meeting Bertram Cox (Hon. Fellow) discussed Composition, and the subsequent meetings Maingot (Fellow) described his work with particular reference to models, Mr. Marcus Adams (Fellow) related his experiences in photographing children in their own homes, and Mr. Charles E. Brown (Associate) told of photography in the air and the sea in war and peace. The meetings were sufficiently successful to induce the Committee to arrange three more meetings, at the first of which F. E. Grattan (Associate) discussed the present position of Pictorial Photography, at the second Mr. G. Scott Bushe (Associate) started a debate whether Composition had become too simple, and the third was to be devoted to the Pictorial Annual Meeting, followed by an Exhibition of some lantern slides by the Hon. Secretary.

Owing, however, to the late issue of the February number of *The Photographic Journal* was not published until late in the month the new publicity could not be given the result that only five members attended on Mr. Scott's evening, and it was resolved to postpone the discussion until the next of the Annual General Meeting on March 5th.

The Group's Annual Exhibition was duly held during June and proved quite as successful as its predecessors in spite of all the time restrictions on photography and difficulty in obtaining materials. It is proposed to hold this Exhibition as usual next June. It is proposed that the Control of Paper which came into force on September 14th last, will make its effect especially in regard to the size of mounts, but the enthusiasm of photographers to-day will probably surmount all discouragements.

The book on "Pictorial Position," written for the Gr

[illegible]

14 March, 1948.

Mr. GRATTAN seconded, and it was carried unanimously.

Mr. TUNN proposed, and Mr. STANFORTH seconded, that a hearty vote of thanks be accorded to the Committee and Officers for their work during the year, which was carried unanimously.

The Hon. SECRETARY proposed that Mr. T. H. B. Scott be re-elected Chairman. He was one of the founders of the Group twenty-five years ago and had been its moving spirit ever since. It was only fitting that so long as his health and strength permitted he should be asked to continue.

Mr. G. C. WESTON seconded, and it was carried unanimously.

Mr. SCOTT said he was very proud to hold the office of Chairman and was proud that the Group had maintained itself and its progress, and was continuing to do good work.

The CHAIRMAN said that Mr. Harry Abbot had been prevailed upon to continue in the role of Hon. Treasurer, and he put it from the chair that he be re-elected.

This also was carried unanimously, as was the proposition that Mr. Dudley Johnston continue as Hon. Secretary.

D.

The present Committee, Messrs. Crosby, Grattan, James, Lawton, Leedham, Mortimer, Stanton and Weston were willing to serve again, and were re-elected *en bloc*.

Exhibition

The CHAIRMAN said that the Pictorial Group Members' Exhibition had been arranged for June, the closing date for entries being Saturday, May 22nd.

The meeting then resolved itself into the Annual Meeting of the Tyng Foundation.

The CHAIRMAN said that for the reason set forth in the last report no purchases were made for the Collection during the year. There had been little opportunity for seeing what was being done in other countries and financial control would render purchasing difficult in any event. The accumulation of interest stood at £254 0s. 6d. on December 31st, 1942.

Mr. ABBOTT, for the benefit of those members not familiar with the terms of the Foundation, said that Mr. Stephen Tyng gave £1,000 for the purchase of prints in duplicate, the purchases to be made by a Committee nominated by the Group, one print stayed in this country and the other was sent to the Smithsonian Institute, Washington. Two amounts of £12 13s. 10d. had been received and an amount in respect of income tax had been recovered, £64 14s. 5d., making the total to be carried forward £254 0s. 6d. The stock was invested in the Government of the Commonwealth of Australia Stock 5 per cent, 1945-75.

Mr. LEEDHAM proposed, Mr. JAMES seconded, and it was carried unanimously, that the report be adopted.

This concluded the formal business of the Annual General Meeting of the Group and of the Tyng Foundation, and an ordinary meeting followed.

COLOUR GROUP

Annual General Meeting

THE Annual General Meeting of the Colour Group was held on Saturday afternoon, March 13th, 1943, with Mr. F. J. TRITTON, Vice-President of the Society, in the chair.

The Minutes of the last Annual General Meeting of the Group were read and confirmed.

The Hon. SECRETARY, Mr. J. H. COOTE, read the Report of the Committee. He said that there were in the Group 120 members at the end of 1942. It was proposed to have during the summer an exhibition of

colour photography by American colour workers.

Annual Report

The year has been an encouraging one for the Colour Group, for the number of members has increased from 109 in 1941 to 190 at the end of 1942.

It seems reasonable to suppose that this revival or increase of interest in the Group has resulted partly from the series of interesting lectures which have been given by notable speakers on a number of the important aspects of colour photography, partly from the periodic distribution of the new "Bulletins of Colour News" and partly from the organisation of the Group's first Exhibition.

The popularity of the "Bulletins of Colour News" has been most encouraging, and every effort should be made on the part of the Committee and the members of the Group to keep alive this extension of our activities by gathering together suitable extracts from current literature or writing short notes on any branch of colour work for inclusion in future "Bulletins."

Our efforts in organising the first Colour Group Exhibition were repaid by the receipt of a good number of exhibits, and the interest which was taken in the discussion on the prints and transparencies. This year, however, it can be foreseen that there will be a shortage of exhibits as a direct result of the almost complete absence of all colour materials, and, accordingly, permission has been obtained from the Council for the Group to organise an Exhibition of colour work by some of the foremost American photographers. This Exhibition, which will be held at the Society's House during the summer, will be in place of an Exhibition of the work of Group members.

Statement of Accounts, 1942

RECEIPTS		£	s	d
By Balance brought forward		45	11	1
" 120 Subscriptions at 2/6		23	15	0
		68	6	1
EXPENDITURE		£	s	d
To Postages, etc.		3	4	11
" Stationery and Printing		9	0	1
" Assistance at Exhibition		1	1	0
" Theatre Box		3	0	0
		16	6	0
" Balance carried forward		52	0	1
		68	6	1

Signed F. G. NEWMARCH,
13th Mar. 1943. Hon. Treasurer.

During the year Mr. F. G. NEWMARCH, F.R.P.S., has represented the Group on the Council of the Society.

The list of lectures or meetings which were held during the 1942-3 season is as follows:—

"With a Camera in the Hills," by W. A. Poucher, A.R.P.S.

"Travelogues in Technicolor," by Jack Cardiff.

"Colour Prints from 35 mm. Transparencies," by Colonel W. Symon, A.R.P.S.

"Colour Prints from Dufaycolor Transparencies," by J. R. Jeffress.

"Discussion on Exhibits from the First Colour Group Exhibition."

"My Methods with Wash-Off Relief," by R. H. E. Beckett, A.R.P.S.

"Excursions with a Cine Camera," by F. G. Newmarch, F.R.P.S.

"Colour Photography—Can it be an Art?" A discussion opened by V. P. Milner, A.R.C.A.

"Separation Negatives from Dufaycolor Originals," by C. H. Beale, A.R.P.S., and Major A. B. Cornwall-Clyne, F.R.P.S.

Thanks are due this year to Mr. G. Scott Bushe, A.R.P.S., for reviewing the colour prints, and to Mr. John Chear, F.R.P.S., for reviewing the colour transparencies exhibited in the Society's Annual Exhibition; and also to Colonel W. Symon, A.R.P.S., for his valuable help in the organisation of the Group Exhibition.

(Signed) JACK H. COOTE,

Honorary Secretary,
Colour Group.

The HON. TREASURER (Mr. F. G. Newmarch) presented the Financial Statement. The financial position of the Group, he said, was quite satisfactory. The membership was going up and there had been no heavy expenses during the year. Subscription revenue had amounted to £23 15s. 0d. There was a balance of income over expenditure amounting to £53 to carry forward to next year.

The CHAIRMAN remarked that the Committee would welcome suggestions for subjects for papers and discussions. It was not very easy to find suitable papers now that the pursuit of colour work was so difficult.

On the proposition of Mr. D. McMASTER (President of the Society) seconded by Colonel W. Symon, the Report and Balance Sheet were adopted.

On the motion of Mr. D. McMASTER seconded by Mr. Scott Bushe, Mr. F. J. Tritton was unanimously re-elected Chairman of the Group.

It was then proposed from the chair, and unanimously agreed to, that Mr. J. H. Coote be re-appointed

Hon. Secretary and Mr. F. G. Newmarch Hon. Treasurer.

The SECRETARY said that Mr. Coote, although willing to continue for a time, was hopeful that some other member would be ready to take over the honorary secretaryship. He (Mr. Coote) considered that it was in the interests of the Group that there should be a periodical change of secretary.

Nominations were then received for membership of the Committee, two members of the old Committee retiring. On a show of hands the following were elected members:—

Messrs. Scott Bushe, John Chear, Coppin, and Colonel W. Symon.

The CHAIRMAN, speaking of Group activities, said that he believed the "Bulletin" had proved a useful asset to the Group, but its preparation was a strain on the Secretary, and any help given in its preparation would be appreciated. The forthcoming Exhibition from America was, he was sure, likely to be most interesting. The Americans had had a better chance of dealing with colour work during these last few years than had workers in this country. He added that the Group was entitled to nominate one member to the Society's Council. Two members of the Committee, Mr. Coote and himself, were already Members of the Council. Mr. Newmarch, who had represented the Group on the Council hitherto, found himself unable to attend meetings of the Council when these were held early in the afternoon. He accordingly suggested the name of Mr. Scott Bushe. It was actually the Committee which made the nomination, but, of course, it would be guided by the choice of the Annual General Meeting.

It was agreed that the name of Mr. Scott Bushe should go forward to the Committee for nomination to the Council.

This concluded the Annual General Meeting.

KINEMATOGRAPH SECTION Annual General Meeting

THE Annual General Meeting of the Kinematograph Section of The Royal Photographic Society was held at 16, Prince's Gate, W.7, on March 20th, 1943, at 2.30 p.m., with Mr. Arthur S. Newman, Hon. F.R.P.S., in the chair.

The Minutes of the last Annual General Meeting, which had been published in the *Journal*, were taken and read.

The Hon. Secretary, Mr. S. Schofield, read the Committee's report for the year 1942-43.

Report of the Committee of the Kinematograph Section for the Year 1942-43

The past year has been one in which there has been a marked increase in the activities of the Kinematograph Section.

Meetings

Attendances at meetings have been most encouraging, and the Section has noted with pleasure the increased number of visitors from other allied organisations. This is a valuable form of publicity which it is hoped to encourage. In addition to the lectures themselves, there have been displays of equipment, and these have given members a chance of handling and examining some of the finest and most modern cine cameras now in use. The members have also had the opportunity of viewing pre-release presentations of noteworthy films, namely, the U.S. Navy Film Unit's production "The Battle of Midway" (a Technicolor 35 mm. reproduction of a 16 mm. "Kodachrome" film), and "Malta, G.C.", a film produced by the Crown, Royal Air Force and Army Film Units. During the month of November, several meetings of cine interest were held at 16, Prince's Gate, under the auspices of the Association of Scientific Workers; these were well attended by members of the Section. Two very successful meetings were held with the Colour Group.

A list of the meetings which have been held approximately at monthly intervals is shown at the foot of the report.

Committee

At the 1942 Annual General Meeting of the Section the following Committee was appointed:—

Chairman: A. S. Newman, Hon. F.R.P.S.

Hon. Secretary: S. Schofield, F.R.P.S.

Acting Treasurer: H. H. Blacklock, F.R.P.S.

Committee: P. W. Harris, F.R.P.S., R. H. Cricks, F.R.P.S., G. H. Sewell, A.R.P.S., T. S. Lutas, A.R.P.S., Dr. H. Mandiwall, F.R.P.S., C. W. Watkins, A.R.P.S., G. C. Weston, Hon. F.R.P.S.

Membership

During the year membership has steadily increased, and is now 145.

Members on Active Service

Many members of the Section are now serving with the Forces in photographic and other capacities, or are otherwise engaged in the War

effort, and the Committee, which has endeavoured to keep in touch with the movements of the members, has learnt from time to time of the excellent work that they are now carrying out on the various battle fronts.

Representation on the Committee of the Federation of Cine Societies

Mr. T. S. Lutas and Mr. F. P. Barnitt, were elected to represent the Section on the Committee of the Cine Federation.

Visits

A visit was paid by members to the Department of Cinematography at the Harrow Technical School.

Publicity

Every effort is made by the Committee to give the activities of the Section as much publicity as possible, and it is very gratifying to note that reports of meetings are regularly appearing in technical and cine Press. Arrangements have also been made to publish regularly in the *Journal* abstracts of cine interests.

Questionnaire to Members

A questionnaire which endeavoured to ascertain the requirements and activities of members was circulated. A high proportion of members replied, and the information thus gained has been of considerable help to the Committee in framing the activities of the Section.

Technical Advice Bureau

A service for giving technical information was introduced some months ago. This scheme has been very much appreciated by the members, and many enquiries have been received.

Film Criticism Service

A film criticism committee has been appointed, and members have been invited to submit films for criticism. Films received in this way are returned to their owners with the least possible delay, accompanied by a written criticism signed by one of the members of the Committee. To date this scheme has met with little response, but this is due, no doubt, to the present film supply situation.

Bulletin

The Committee realised that a bulletin giving members current information on cine matters would be very much appreciated, but the issue of such a publication is prohibited by war-time conditions.

Aims of the Group

The Committee spent considerable time in discussing the aims of the Section, and these have now been defined as follows:

- (1) To hold meetings to read and discuss communications.
- (2) To hold exhibitions of films, equipment, etc., of cine interest.
- (3) To invite members to send their films for criticism by a special committee appointed for that purpose.
- (4) To create and to maintain a library of films and or co-operate with other bodies having similar aims.
- (5) To encourage cine research and to give advice and information to members.
- (6) To encourage the use of cinematography as an educational medium.

The object of publishing these aims in the Annual Report is to give members an idea of the aims to which the Committee is striving.

Improvement to Projection Facilities

The Committee has been very conscious of the inadequate projection facilities at 16, Prince's Gate, and while it is realised that major alterations are not possible, it has been decided to improve by improvised methods the facilities now available. It is hoped that these alterations will be completed within a very short while.

Honorary Fellowship

The Committee of the Section appreciates the action of the Council in conferring the Honorary Fellowship on two figures well known to members of the Section, namely, Mr. G. C. Weston, our newly-appointed Treasurer, and Mr. Cecil Hepworth, the pioneer film worker.

We congratulate these gentlemen on the receipt of this well-merited recognition of their services to photography and cinematography.

Appreciation

The Committee would like to acknowledge with grateful thanks the services of all those who have contributed papers and lectures during the past year, also the services of Mr. Goldsmith, our projectionist, who has always been "present and correct" at the meetings held at 16, Prince's Gate.

In conclusion, the Committee would like to express their appreciation of the services of their chairman, Mr. A. S. Newman, whose untiring energy and inspiring leadership have been directed to the well-being of the Section.

Signed on behalf of the Committee,
G. C. WESTON.
PERCY W. HARRIS.

The Chairman asked if members had any comments or suggestions to make on the activities of the Section during the last year, and for its improvement in the coming year.

Mr. Peter Hennessy wished to propose a very hearty vote of thanks to the Committee and to all members who had helped them. He hoped they would continue their very successful programme in the coming year. They had done admirable work.

Mr. D. McMaster seconded the vote of thanks, which was carried by acclamation.

The Chairman said he was in the Section when it started. It had been through many difficulties, and he began to think that it would die, but it had been greatly resuscitated, which was due to the Honorary Secretary. Thanks were due to him more than any other member of the Section—at least, that was his own opinion.

Mr. Schofield, the Hon. Secretary, in replying, said that when he attended the Annual General Meeting last year, he had done so as a comparative stranger, and he was more than surprised when he was invited to act as Secretary to the Section, but he had, however, undertaken these duties, and with the help of the members of the Committee, from whom he had always received the utmost co-operation, an ambitious programme had been carried out. He also added a word of thanks to Mr. Blacklock, who had carried out the duties of Treasurer during the year. Mr. Blacklock had always been ready, together with the other members of the Committee, to give advice and help, and no one realised more than he how this had contributed to the success of the Section's activities.

Mr. Schofield said that he hoped that the membership of the Section would increase still further, and he was hoping that he would be able to announce at the next Annual General Meeting a membership of at least 200.

The statement of accounts was then presented.

Statement of Accounts, 1942

RECEIPTS
To Balance at 1st January, 1942 ... 49
„ Subscriptions 26

£76

EXPENDITURE
Kinematograph Year Book, etc. ... 1
Stationery and Printing 5
Lecture Expenses 1
Postages and Telephone 7
Typing 5
Sundries 1
Hire of Theatre for 35 mm. programme, 15/12/42 12
Balance at December 31st, 1942, £61. 18s. 8d.
*Less amount paid in 1943 £18. 14s. 0d. 42

£76

*Theatre Hire 12
Lecture Expense 1
Postages and Telephones 3
Printing 1
Typing 1
Sundries 1

£18

(Signed) H. H. BLACKLOCK, *Acting T*

I have examined the accounts and verified and received all explanations I have received and certify the foregoing statement correct.

(Signed) T. S. L.

Mr. McMaster moved that report and accounts be accepted. Watkins seconded and it was carried.

Election of Committee

The Hon. Secretary said he decided to hold an election for Officers and Committee, and Scrutineers, Mr. Dudley John Hon. F.R.P.S., and Miss F. Golds had reported that the following elected:—

Chairman: A. S. Newman, F.R.P.S. (unopposed).
Treasurer: G. C. Weston, F.R.P.S. (unopposed).
Hon. Secretary: S. Sch F.R.P.S. (unopposed).
Committee: R. H. Cricks, F.F. Percy W. Harris, F.R.P.S. Mandiwall, F.R.P.S., G. Sewell, A.R.P.S., F. I. D. Wratten.

Forty-three ballot papers submitted, one of which was qualified. The report was signed by the Hon. Secretary, Dudley John and Miss F. Goldsmith.

This concluded the business of the Annual General Meeting.

Meetings arranged by the Kine-matograph Section during the Year 1942-43

June 26. "The Instructional Film," by R. H. Cricks, F.R.P.S.

July 24. "Early Days of Cinematography," by A. S. Newman, Hon. F.R.P.S.

October 17. "Cinematography in War Time," No. 1. "Entertaining His Majesty's Forces with 16 mm. Film," by Alexander Victor.

November 14. "Cinematography in War Time," No. 2. "The Work of the U.S. Navy Film Unit," by Lt. M. E. Armistead, U.S.N.

December 19. "Cinematography in War Time," No. 3. "The British War Correspondent in Action," by a Newsreel Cameraman.

January 16. "The Film and the Dynamics of Living Matter," by Professor J. Yule Bogue.

February 20th. "Cinematography in War Time," No. 4. "Film Making with the R.A.F." by Squadron Leader E. Baird.

March 20. "Hollywood from Within." "The Relationship Between Director and Cameraman," by Wm. Wyler and Wm. V. Skall.

MINIATURE CAMERA GROUP Annual General Meeting

THE Annual General Meeting of the Miniature Camera Group of the Society was held at 16, Prince's Gate, S.W.7, on Saturday, March 27th, 1943, Mr. PERCY W. HARRIS presiding.

The CHAIRMAN said that it was in October, 1936, that a special meeting was called at the old premises in Russell Square to discuss miniature matters, and the President, Dr. Spencer, at the end of the meeting announced that a discussion would take place as to the advisability of starting a Miniature Camera Group in the Society. At this discussion it was agreed to form such a group, and, after much argument, a large majority agreed that the definition of "miniature" should be a camera taking a negative not larger than six square inches.

The first Annual General Meeting was held in the following February, and the provisional Committee, elected at the first Meeting, was confirmed. Now, in 1943, they were holding their seventh Annual General Meeting. In spite of the war the Group was in a healthy position, both with regard to membership and finance. He wished to pay tribute to the energy and enthusiastic work of the Hon. Secretary, Colonel Symon. The Secretaryship of the Group

involved a good deal of work which had been very well carried out by Colonel Symon, and he wished, on behalf of the Group, to tender their grateful thanks. He hoped Colonel Symon would remain Secretary for many long years to come (Applause).

The HON. SECRETARY (Colonel Symon) then gave his report.

Hon. Secretary's Report

At the end of 1941 the membership of the Group was 164. During 1942 29 of the old members dropped out for one reason or another, but 99 new members joined the Group. I regret to report that during the year two members, namely, Prince Chirasaki and Mr. A. F. W. Tabor, have died. The membership, therefore, at the end of 1942 was 232, a net gain of 68.

It will be remembered that, at the last Annual General Meeting, a proposal was put forward by Mr. Sharman, and carried, that postal portfolios should be formed within the Group, and the Committee was asked to draw up the necessary scheme and rules for getting these portfolios into working existence.

Circulars, approved by the Committee, were sent out early in May, 1942, to all existing members and, subsequently, to all new members. The response was above expectation, and, before the end of the year, five circles of fifteen members each had been formed and were in operation. All these circles are now running two portfolios each. Each circle was supplied with the necessary gear, this being paid for out of the funds of the Group.

The two best prints, according to voting, of each round of each circle are being exhibited.

I have to thank the Hon. Secretaries of the circles for their help in getting the portfolios started up and running.

Since the beginning of the present year more applications to join portfolios have been received, a sixth circle has therefore been formed and this is already 60 per cent complete.

It was only possible to arrange for two lectures since the last Annual General Meeting, namely, the lectures held in January and February this year. But there was a joint meeting with the Colour Group in July, 1942.

For the Annual Exhibition of the Miniature Camera Group for the year 1943, 63 members submitted 276 prints, of these 110 have been selected for hanging. A very satisfactory result considering the difficulties under which members have to work these days.

It is regretted that, owing to paper shortage, a separate catalogue for the Miniature Camera Group Exhibition could not be produced, but it is hoped that a list of the prints accepted and hung, together with a report of the criticisms, will appear in either the April or May number of the *Journal*.

The outlook of the Group seems very good, judging from the number of new members who have already joined this year.

(Signed) W. C. SYMON,
Hon. Secretary,
Miniature Camera Group.
March 27th, 1943.

Financial Report

The HON. TREASURER (Mr. R. H. Lawton) said that the balance brought forward at the beginning of the year was £108 17s. 9d., subscriptions received amounted to £64 11s., postage on Exhibition returns £1 7s. 2d., making a total of £174 15s. 11d. On the expenditure side, postages cost £4 10s. 9d., stationery £29 4s. 7d., which included all the portfolio sundries, fibre cases £5 8s., blocks for Exhibition purposes £19 3s. 4d., honorariums to one or two members £4 4s., making a total of £62 10s. 8d., leaving a balance in hand of £112 5s. 3d.

Statement of Accounts, 1942

RECEIPTS		£	s.	d.
To Balance at 1st January, 1942		108	17	9
„ Subscriptions	...	64	11	0
„ Postage on Exhibition Returns	...	1	7	2
		<hr/> £174 15 11		
EXPENDITURE		£	s.	d.
By Postages	...	4	10	9
„ Stationery	...	29	4	7
„ Fibre Cases for Postal Circles	...	5	8	0
„ Blocks for Report of Exhibition	...	19	3	4
„ Assistance	...	4	4	0
„ Balance	...	112	5	3
		<hr/> £174 15 11		

(Signed) R. H. LAWTON,
27th March, 1943 Hon. Treasurer.

Election of Committee

The CHAIRMAN said that the present Committee had been in office for the last three years, with the exception of the change in the Honorary Secretary. Dr. Olaf Bloch and Dr. Spencer had notified him that they did not desire re-nomination. Two names had been put forward to fill the vacancies, Mr. E. H. Sharman (Associate), the Hon. Secretary of Circle A, and Mr. R. H. Mason, Hon. Secretary, Circle B. It

was Mr. Sharman who put forward the suggestion that these circles should be created at the last Annual General Meeting, a suggestion which had met with great success. There were no other nominations.

Mr. MURFIELD proposed, Mr. FIELD seconded, that Mr. Sharman and Mr. Mason be elected to the Committee, which was carried, and the Committee was re-elected as follows:

Messrs. Percy W. Harris, F.R.P.S., Stanley W. Bowler, F.R.P.S., The Hon. M. W. Elphinstone, F.R.P.S., Messrs. R. H. Lawton, F.R.P.S., D. McMaster, F.R.P.S., G. B. Macalpine, B.Sc., H. S. Newcombe, F.R.P.S., R. H. Mason, Paul Shillabeer, F.R.P.S., F. H. Sharman, and Col. W. C. Symon, A.R.P.S.

Representative on Council

The CHAIRMAN having been elected to the Council of the Society, under Article of Association 41, the Group was asked to elect a member to serve on the Council. He proposed from the chair that Colonel Symon be nominated as the Group's representative on the Council. This was seconded by Mr. R. H. Mason and carried.

Suggestions

The CHAIRMAN said that it would assist the Committee if members would put forward suggestions for future lectures. A successful discussion was held regarding the post-war miniature camera, and it was suggested that there should be a continuation of that discussion from the point of view of the 2½ in. square cameras with ideas for post-war improvements. Then there could be a discussion on the accessories for use in conjunction with miniature cameras. These meetings were a good opportunity for telling the manufacturers what was wrong and what photographers would like. The manufacturers listened carefully to the points raised at responsible meetings with regard to public requirements. Colonel Symon would be very pleased to receive from members any ideas for lectures and discussions in the future.

With regard to postal portfolios, the sixth circle was now 60 per cent complete. Should the membership be increased to twenty or should waiting list be formed? Equipment was available for the sixth circle, but difficulty might be experienced in providing for future circles. What did members feel about increasing the membership to twenty?

Mr. Huxon said he would regret seeing the number raised above

fifteen. The round took a long time, and when the first five or six critics had had their say the others had very little left on which to comment. He suggested the waiting list was the better alternative.

Mr. SHARMAN also thought it better to have waiting lists if the necessary equipment could be obtained.

Mr. LAWTON and Colonel SYMON also thought the membership of the circles should be confined to fifteen, and it was thus agreed.

Mr. McMASTER suggested that there should be more meetings under the aegis of the Miniature Camera Group. Most of the other Groups in

the Society had had quite a number of meetings, and the Kinematograph Section, which was moribund a two years ago, had become one of the most active during the last year. He thought the Miniature Camera Group should sponsor, if possible, at least half-a-dozen meetings.

The CHAIRMAN asked if members would prefer to hold the meeting the evening rather than Saturday afternoon. From the lack of comment the Chairman inferred that members preferred Saturday afternoon meetings under present circumstances.

This concluded the formal business of the Annual General Meeting.

THE BOOKSHELF

Document Photography Individual Copying and Mass Recording. By H. W. Greenwood. London: The Focal Press, Ltd. Price 7s. 6d.

Document photography is a branch of copying primarily dealing with black-and-white line subjects, while copying itself is often looked upon as a simple branch of photography, so it comes as a surprise to many that the preparation of adequate duplicates of a series of documents is nothing like as simple as they thought. A perusal of this book, running to 150 pages packed with information, will demonstrate the many-sided nature of the problems and methods involved, and at the same time explain in a simple and lucid manner how the best results can be obtained.

As the sub title indicates, methods applicable to the amateur are dealt with alongside the commercial mass production technique, but the descriptions of apparatus are kept separate, while the basic details of processing are, of course, the same. All available methods are fully described: reflex, Photostat, moderately reduced film negatives and micro-copying. British practice and apparatus are adequately described, but owing to the paucity of designs available, reference has been made to some German copying cameras little known here, such as the Filmomat, although there is no mention of the American Micro-File cameras, of which several are in operation in British institutions. The fact that quite good micro-copying can be done with a converted 35 mm. cine camera is explained, but such cameras are made to appear rather more limited in scope than the reviewer has found

in practical work, in which documents from 5 × 3 up to 20 × 16 inches regularly copied. When describing the use of miniature cameras, there is no reference to the miniature reflex, such as the Kine Exa, which is really one of the most suitable cameras for amateur micro-copying.

Despite a careful search no commendations have been found which could be criticised, except possibly the suggestion that when copying halftone illustrations the lens should be stopped down to f.64 to introduce diffraction, and so eliminate the structure. While there may be harm in doing so, experience has shown that it is unnecessary; all that is required being to control the contrast, as fully explained by J. Greenwood.

One important omission is a reference to the preparation of 16 mm. positive prints from micro negatives. No doubt this is because the preparation of positives in short lengths is tedious, and their preparation in bulk requires specialised apparatus, but some mention of where to obtain such copies is of importance. The necessity for consulting positive copies, when frequent reference required, and carefully preserving the negatives, is stressed in the section on preservation of records.

Altogether, this is a comprehensive reference and instruction book, which will be of immense benefit to every one interested in document photography whether amateur or professional. The Focal Press are to be complimented on a nicely set up and printed book, free from errors.

F. J. FRITTON.

THE R.P.S. LIBRARY

Value of Photographic Books, Periodicals and Libraries

Value of the R.P.S. is one of its major assets, but very valuable and extensive complete.

It is feared that quite a number of scarce books, pamphlets, periodicals on photography, would be of value to our Society but are lost in the paper sal-

Photography is so young that its publications (all being prior to 1839) will not attract attention when waste paper is collected, and yet it is difficult, nay, often impossible, to find in the R.P.S. and other photographic publications. Some of the R.P.S., secretaries, clubs, etc., are therefore requested to be on the look-out (i.e., pre-1900) printed material with photography, books, but also trade pamphlets, catalogues, instruction books, and to send full particulars to the R.P.S.

There is some doubt whether to rely on the R.P.S., it is suggested that they should consult catalogues of the periodicals in the R.P.S. Library in *Phot. Journal*, 75, 1935, 1, and 79, 1939, between 1 and 589. Every item not in the R.P.S. can be considered as rare, and not easily accessible. In the English and foreign periodicals (1914-18, 1939-1943) saved, because only limited numbers of these issues have been printed it is difficult to fill gaps and will be still more so in the future.

Very, in the absence of the *The Photographic Journal* readers are invited to write to the Society. Filling the gaps, the R.P.S. wishes to accumulate several English and American photographic periodicals (including *Photographic Journal*) for or continental ones after cause we frequently have the exchange method for various journals.

It is emphasised that this restricted accumulation of paper does not impede to a large degree the national drive, as it is an aid well-considered policy routine.

If anyone hears of the dispersal of a collection of periodicals on photography, notify the R.P.S. at once.

There have been several cases of valuable private collections being sent for pulping, dispersed at auction sales, or lost track of, to the permanent detriment of photographic historical or bibliographical research. As an instance, where is the collection formed by W. J. Harrison? Judging from his "Contributions to the Bibliography of Photography," pub-

lished in *Phot. News*, 1886-1888, he must have had a unique collection of (a) books and (b) periodicals on photography, and a large index of references to (c) articles on photography published in non-photographic journals, and (d) books illustrated with early photographs. The series of articles in *Phot. News* deals only with (a) and (b); (c) and (d) were announced but apparently never published. The manuscript may still exist in his collection of books; but where is it now?

THE LIBRARY COMMITTEE, R.P.S.

OBITUARY: W. R. WEBB

The photographic world in general and British manufacturing circles in particular have suffered a severe loss in the sudden death of Mr. William Robert Webb, of "The Glen," Green Lane, Northwood, Middlesex, and a Director of Kodak Ltd. Mr. Webb died suddenly from a heart attack while chatting with friends.

Mr. Webb, who was only 54 years of age, had a most distinguished scholastic career, and had been on the scientific and technical side of photography with Messrs. Kodak for 27 years. He was born in October, 1888, at Detroit, Michigan, U.S.A., and was graduated in sciences with both Bachelor's and Master's degrees at the University of Michigan. For some time he was a research fellow in organic chemistry at that university. In 1915 Mr. Webb joined the Kodak Research Laboratories at Rochester, New York, and specialised in investigations into cellulose derivatives. He first came to Europe in 1919 on a special mission, and during that time collaborated with scientific workers in Vienna and Berlin. In 1927 he established and became manager of the new Kodak factory in Berlin, and in 1931 was appointed manager of the Kodak works at Harrow. In 1939 he was made Assistant European General Manager.

Mr. Webb was held in great affection by a wide circle of friends in business and private life. He was noted for his keen scientific intelligence and for his high good humour. He was a prominent member of the Photographic Manufacturers' Golfing Association, and served as captain of the golf team of that organisation for the last two years prior to the commencement of war. He was on many committees having to do with photographic standardisation, and his breadth of interests caused him to be in demand as a referee and arbitrator. He was a member of The Royal Photographic Society of Great Britain, of the American Club of



The late Mr. W. R. Webb

London, the American Chamber of Commerce, Moor Park Golf Club, and of Masonic organisations. He was prominent in the affairs of the American Chemical Society, and had been elected to the American Society of Sigma Xi, an honorary scholastic society.

Our sincerest sympathy goes out to his widow, Mrs. Edna Nancy Webb, of Northwood, and to his two children, Nancy and William Junior, who are at present in the United States.

D. McMASTER.

The Fountain Press

The Fountain Press have recently moved into new premises at 46 47, Chancery Lane, London, W.C.2. In these more convenient and easily accessible premises The Fountain Press are able to provide an even better service to their old friends, and will welcome enquiries from new customers.

Items of Interest from Various Quarters

It is regretted that owing to exceptional pressure on space this feature has had to be held over.

ANNOUNCEMENT

R.P.S. ANNUAL EXHIBITION

The 87th Annual Exhibition of The Royal Photographic Society will be held from Saturday, September 4th, to Saturday, October 23rd, at the Society's Galleries, 16, Prince's Gate, London, S.W.7.

There are six sections :—

- (1) Pictorial Photography (Prints and Monochrome Lantern Slides).
- (2) Colour Photography (Prints and Transparencies).
- (3) Scientific and Technical Photography, including (a) Photomicrography; (b) Radiographs; (c) Astronomical, Aerial and Meteorological Photography; (d) Geological and Metallurgical Photography; (e) Survey and Record Photography; and (f) Scientific and Technical Photography other than (a) to (e).
- (4) Natural History Photography (Prints and Transparencies).
- (5) Stereoscopic Prints and Transparencies.
- (6) Press, Theatrical, Commercial and Advertising Photography.

The importation of photographs from overseas is, generally speaking, prohibited, but the Society holds a special licence under which it is permitted to import photographs for its exhibitions.

Pictures sent by parcel post will be permitted to enter the country, but will be subject to a small import duty, amounting to two or three shillings per parcel, which will be defrayed by the Society.

Prints may be sent unmounted by printed matter or letter post; entry forms (or a letter containing particulars of the prints and a declaration that they are submitted subject to the conditions governing the acceptance of prints) should be posted separately. They must arrive at the Society's House, 16, Prince's Gate, London, S.W.7, not later than Saturday, July 24th.

Unmounted prints accepted for the Exhibition will be mounted. It is hoped that overseas exhibitors will make every effort to support the Exhibition, and their co-operation will be greatly appreciated.

Not more than four prints may be submitted in Section 1 (a) or six prints in Section 2 (a) or more prints than can be mounted on four 20 x 16-inch mounts in Section 4.

The standard sizes for mounts are 20 x 16 and 16 x 12 inches, but margins must not exceed the dimensions stipulated in the Control of Paper Order No. 48 (approximately one inch all round) unless the prints were mounted prior to September 14th, 1942, when the Order came into force. (This stipulation does not apply to work sent in from overseas). If the mounts do not conform to the standard sizes, they will, if accepted, be attached, during the Exhibition, to mounts of these sizes, supplied by the Society.

In the Pictorial, Natural History and Colour Sections mounts should be white on cream, and in all sections, wherever possible, mounts of standard sizes should be used. When a series of prints illustrating one subject is to be shown, as many prints as may be convenient should be placed on one mount.

On account of the paper position the Entry Form is not being distributed with the *Journal* this year. It may be obtained upon application to, the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2 2s. 0d.; Group subscriptions, which become due for renewal on the same day, are as follows: Scientific and Technical Group, 7s. 6d.; Pictorial Group, 10s. 0d.; Colour Group, 2s. 6d.; Miniature Camera Group, 10s. 0d.; Kinematograph Section, 5s. 0d.

Group subscriptions may be included with the Annual Subscription, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscription to the Society through their own Bank to The National City Bank of New York in New York, or direct to The National City Bank of New York. Such subscriptions should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the National City Bank, Russell Square Branch, London, account. Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to ask them to mention their names, addresses and positions (Fellow, Associate, Member); and Members making remittance direct to The National City Bank of New York are requested to give this information.

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It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

LECTURE PROGRAMME

Wednesday, May 19th, 7 p.m.
Informal Meeting of the Kinematograph Section. "The Advance of 16 mm." By Andrew Buchanan.

Tuesday, May 25th, 6 p.m.
"Photography and the Drawing Office." By F. J. Tritton, B.Sc., F.I.C., F.R.P.S.

Wednesday, June 9th, 7 p.m.
Informal Meeting of the Kinematograph Section. "Preparing the Script." By Adrian Brunel, A.R.P.S.

Saturday, June 12th, 3 p.m.
Informal Meeting of the Miniature Camera Group. "A Talk on Fine Grain Development." By A. L. M. Sowerby, A.R.P.S.

Saturday, June 19th, 3 p.m.
At the Royal Institution, Albemarle Street, Piccadilly, W.1. The Midsummer Address, arranged by the Kinematograph Section. To be given by Leslie Howard.

Wednesday, June 30th
Informal Meeting of the Pictorial Section. Demonstration of "Exposure and Studio Technique (16 mm.)." By Stanley F.R.P.S.

Saturday, July 10th
Informal Meeting of the Pictorial Section. A Visit to Studios at Denham. Falls to be announced. By A. Watkins.

EXHIBITIONS AT PRINCE'S GATE

May 4th-31st. (1) Celebration of Photographic (2) U.S. Office of War Information. "California." By Arad.

THE SOCIETY'S HOUSE
The Society's House, Prince's Gate, S.W.7, will be open from 10 a.m. to 8 p.m. on Friday, and from 10 a.m. to 6 p.m. on Saturday, until notice.

THE PHOTOGRAPHIC JOURNAL

THE OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND
THE PHOTOGRAPHIC ALLIANCE

HONORARY ADVISORY EDITORS.—*Scientific and Technical Section* : C. WALLER, M.Sc., A.I.C., F.R.P.S.
Literary Section : J. DUDLEY JOHNSTON, HON. F.R.P.S. *Kinematograph Section* : ARTHUR S. NEWMAN, HON. F.R.P.S.
EDITOR : H. H. BLACKLOCK, F.R.P.S.

VOLUME
XXIII

JUNE, 1943

TWO SHILLINGS
AND SIXPENCE



THE BISHOP'S DOOR, ZAMORA CATHEDRAL

From the Exhibition, "Spanish Cathedrals and Churches," by J. R. H. Weaver, M.A.



Afterglow, Marisco, Skye

HEBRIDEAN MEMORIES

G. B. Kearey, F.R.P.S., F.I.B.P., F.Z.S., M.B.O.U.

A lantern lecture, given at a meeting of The Royal Photographic Society, at 16, Prince's Gate, S.W.7, on January 2nd, 1943, with the President, Mr. D. McMaster, F.R.P.S., in the chair.

MR. KEAREY held the entire interest of his audience for an hour and forty minutes, and showed over one hundred slides, many of great beauty. The first was a view on a wet day from a peak of Culmor, in West Sutherland, looking out over the Atlantic to the long line of cumulus clouds lying over the Long Island or the Outer Hebrides, a collection of islands, large and small, extending for 120 miles. The Hebridean people, who were once self-supporting, were nowadays more and more dependent on the outside world for assistance; even bread was sent by steamer from Glasgow. The next view was taken from the steamer as it approached Tarbert, on the Isle of Harris, to which he went to study the making

of tweeds and some of the local birds. On Harris, at Rodel, was the most important church in the Outer Hebrides, ranking with Iona in some respects. It was accidentally destroyed by fire and repaired in 1870. On the church tower were sculptured figures of the last kind one would ever expect to find on an ecclesiastical edifice. The church was in the care of the Office of Works, and is well cared for. To obtain photographs including sunshine in the east end and the transepts it was necessary to borrow a key overnight, have a late evening meal, read a newspaper out of doors at midnight, and afterwards take a slow walk to the church, and secure the photographs as the first gleam of dawn came through the east window.

In these islands they have numbers

of sheep from which wool is obtained to make the famous Harris tweeds, an industry now protected, resulting in greater benefit to the inhabitants. Studies of the new industry are quite easily obtained by the kind co-operation of the people. Going south we find that the Sound of Harris, the feeding place of many sea birds. North Uist and South Uist represented the kind of place where the sea was all islands and the land a water. In many places it was difficult to make one's way about, but if one could read a map much useless walking would be saved, and precious time so saved better utilised. He never stopped, if possible, at the port of call of the steamer, preferring, where possible, to carry on to a much smaller township, getting nearer the subject

ch he was in quest. A very own photographer arrived by c, desiring to photograph a hich nested in this locality. a retinue of four gamekeepers, is bill certainly was more than of pounds, yet he was never even to see the bird in n. It is policy to endeavour s in a quieter district, results will justify it. Mr. Kearey ld there that Mr. Oliver G. as one of the first to visit here tograph the black throated some time afterwards he sent to folk who had helped him, however, declared that the raphs were not genuine, and had painted in the stripes on ls himself. The truth was, of that the natives had never e birds at the close quarters l by the photographer.

Kearey described how he raphed the hooded crow, by g it with the carcase of a eep. It being summer time, abundance of shell fish on all aches, the birds were very at to come to bait, and after f waiting the picture was within the last half hour it was necessary to leave for o. Another bird to be found Hebrides is the Arctic skua, r distributed, and much more the grey lag goose and the r swan.

owing a Hebridean village, arey said that it was easier to house there than at home. ne was from the old houses or , the walls were double layers e filled up with rubble, but was needed for the roof, r with slates or thatch; the difficulties were usually surd by obtaining a loan from the Government Boards. The here, although they had been sed by some commercial visi- ere very friendly, and if only sman took you under his id introduced you they were ed at once of your genuine- d honesty. He became quite within a short time with two es who lived together; one of as a crack spinner and had no y in disposing of the results labour. In the old days in ottages fires were often placed middle of the floor, and now e mostly at the end of the

The floors were beautifully wept out every morning and ed with silvery sand from the e. The ceilings may be heavily ed with spiders' webs discol- y the peat smoke, making them as though they were black silk, h no one could complain.

Mr. Kearey next took his audience to Barra, arriving at Castle Bay, where is Kisamul Castle, the ancestral home and stronghold of the Macneils of Barra, which stands on an isolated rock in the Bay. It is certainly the grandest and most picturesque ruin in the Western Islands. A modern scene round the bay showed the women at work at the different fish curing stations. In most of the larger islands there are one or more Pictish Brochs, sometimes in a lochan with a causeway now submerged. In the centre of Barra is the Dark Glen, the scene of the spring and summer activities of the neighbouring crofters' digging, drying and carting the peat for the year's fuel. In North Bay, in the sands, are enormous quantities of cockles, the edible part used as food, the shells burnt down to form a kind of white cement used in house building. In the agricultural side of their

livelihood, the women appeared to be much more proficient than the men-folk, because the latter spent so large a part of their lives on the sea. Even on a comparatively small island like Barra perfect solitude could be enjoyed. It was pointed out, for those whose time was limited, that Barra certainly represented the Hebrides in miniature, and much could be seen in little time. He showed views of Mingulay and some of its birds; Barra Head lighthouse, indicating how beautifully such lighthouses were kept, and described how visitors were welcomed.

At Mallaig, the auctioneer was alleged to tell his story in Gaelic, broad Scotch, and English, but it all appeared to be one to the Southern listener, and caused bewilderment when the official declared which gentleman had bought the fish and for how much.

The next slides showed an assort-



In St. Clements, Rodel, Harris



Kisamul, Castle Bay, Barra

ment of the possibilities of Skye, the misty isle. Portree was suggested as a good centre from which to tour the island. Slides were shown of some of the castles, including that of Duntulm, the remains of the castle which belonged to the Macdonalds for centuries. Dunvegan Castle, the home of the Macleods of Macleod, was generally agreed to be the oldest inhabited castle in Scotland. Many additions had been made to it through the ages, and the family traditions were extremely varied and numerous.

The wonderful mountains known as the Coolins were the chief attraction for those who went to climb, and these unique mountains undoubtedly provide them with the relaxation and enjoyment which perhaps they themselves can only appreciate. The same mountains to the uninitiated constantly provide trouble. The areas are vast, people foolishly attempt the impossible, find themselves in trouble, discover they are lost, and on occasions the inevitable happens and people perish. On occasions like these the inhabitants, shepherds, gillies and stalkers, from a common humanity point of view, put down their work, organise search parties, and day after day search this enormous area, possibly without any definite clues to work on. Some slides were shown of the Coolins, emphasising their forbidding aspect, their colouring, and their contours from sea level, and from the pinnacle ridge, in sunshine and shadow, and in the majesty of evening sunsets.

Another subject dealt with was the footplough, of which it was claimed that it was easier to delve with than any spade. These ancient implements were very rare.

Mull was next visited. The landing could be made at many places by motor boat or the regular steamers. Salen was taken as a good centre, though trips and sojourns had been made throughout the length and breadth of the island. Tobermory was a delightful place to stay from

which to search the northern part of the island. The round tower church at Dervaig, the salmonies on the coast, the rhododendrons in profusion, were subjects present on the one outing. On another it was possible to visit Tigh na n-Oidhche, Duart Castle, and the ferry to Black, the novelist, all looking the Sound of Mull, remarkable views up Loch Linnhe where the mountains almost round Glencoe. From the rocks at the end of the Ross of Mull the ferry goes to Iona. The colouring is as marvellous as anywhere in the west. Iona is about a half mile long and one half wide. It was here that Columba decided to found a monastery. He showed pictures of the various remains on the island, including the restored cathedral of Relig Oran, the oldest Christian burial place in Scotland, reputed to contain the graves of forty Scottish, four Irish and eight English monarchs. While showing a picture to tourists looking at these graves he told a story of one lady who asked an officer from the boat which was the grave of Macbeth. "The second one on the left, madam," was his reply. "But are you sure," she persisted. "when I was here last year the officer told me it was the fourth from the left." "Well, you see, madam," was the reply, "the people here have a little to do in the winter and often rearrange the gravestones, tidying up the graveyard." The officer described the crosses, mentioning that there were supposed to be



Dunvegan Castle, Skye



Age and Youth

more than 300 known crosses
island at one time.

A few altar of the cathedral was
the famous white and green
ruble, which was used so much
ing the wonderful war mem-
Edinburgh. He also showed
the interior, the sedilia, and
mba's pillow, but the sacristy
s the thing he liked best.

the lecturer next took his audience
famous Fingal's Cave. The
of the cave and the depth of
er at ordinary tide was sup-
to be the same. He pointed
v the rocks were battered
e winter tempests, and the
ul colonnading. Wonderful
l pictures could easily be
l on the nearby Tresnish
if one could prevail upon a
to take you in a launch.
could be very tame, and he
hed them back a little, then
a the reflex to see if they were

Cormorants and shags are
the island, and show great
ice at intrusion. There are
ttiwake colonies which could
e approached. The lecturer
to see these birds behaving
fect cannibals as he has
ly seen the rest of the

he west of Jura was some
ble coastal scenery, and the
Jura, three wonderful moun-
ominate the interior. In the
one evening he was taken
by two stalkers, and in half
had more than enough fish
boat; had they continued
for an hour catching at the

same rate the boat would probably
have sunk. The most marvellous
sunsets could be seen here, and many
people may be pardoned for thinking
the slides an exaggeration, but
seeing was believing.

He also showed some pictures
taken on Islay, at Port Askaig, of
Bowmore, with its round church at
the top of the main street, of the
coastal scenery, the rocks and waves,
the present chief port of call of Port
Ellen, with its almost landlocked
harbour and its delightful old-world
cottages. Continuing along to the

south-east, to the ancient burial
place of Kildalton, with its famous
church, sculptured monuments and
crosses. Interspersed were many
nature pictures, taken throughout
the length and breadth of the Inner
and Outer Hebrides.

In conclusion, Mr. Kearey showed
as a lantern slide a letter received
from some people with whom he had
stayed, expressing regret that in the
hurry of his leaving they had in-
advertently overlooked the amount
of money he had given them. This,
in their opinion, had been too much
to the extent of £1, which they were
herewith returning, hoping he would
receive it safely, and welcoming him
back whenever he cared to return.
The letter illustrated the generosity,
the friendliness, and the non-cupidity
of these delightful island people.

Vote of Thanks

The PRESIDENT expressed the
thanks of the audience to Mr. Kearey.

They were, he said, especially in-
debted to Mr. Kearey on this occasion
for at short notice he had cut an all-
too-brief and much-needed change
in the Hebrides to travel the long
journey to London to give them this
delightful lecture. All that he had
had to tell them had been of the
greatest possible interest, and this
had been enhanced by the admirable
slides which he had shown them.

The vote of thanks was enthusias-
tically carried by acclamation.

Mr. KEAREY, after thanking the
lanternist, said how great an honour
he esteemed it to come and lecture to
The Royal Photographic Society.
(Applause).



Gulls on Trawler



Portrait in
Dutch Style

R. G. Fennah,
F.R.P.S.

**"Portrait in Dutch Style," by
R. G. Fennah, F.R.P.S.**

MR. DUDLEY JOHNSTON: This pictorial subject is naturally inclined to be rather stiff. The subject is very well placed, the lighting is good, perhaps the collar is a little blank and lacking in modelling. The background is not absolutely blank and there is sufficient gradation to give an effect of air and space behind the head.

MR. McMASTER: I consider this one of the really good-quality prints in the show. The negative has a good deal in it, and the author has given a pleasing tone to the print; he has kept his scale of gradation, and I agree with Mr. Johnston—it is a successful and pleasing print. The lack of modelling in the collar does not bother me unduly, because there is a considerable measure of modelling in the face.

**"Decorative Panel," by R. G.
Fennah, F.R.P.S.**

MR. McMASTER: This is a superlatively correct picture in the sense that the exposure has been exact, the negative has been developed properly and the print has been made to give all the definition required for the panel effect, and yet there is a certain air of softness given to it by the tone of the print. It is one of the fine technical efforts of the show.

MR. DUDLEY JOHNSTON: As a still life arrangement it is decidedly successful, the placing of the main subjects of the picture is very happy, on the whole. There are certain points I do not like; there seems to be a sort of halo round the small jar, with a suggestion of it behind the ivory figure. I do not like the folds of the table cloth, it makes too artificial an arrangement and does not lead up to the figure very satisfactorily.

MINIATURE CAMERA GRO

Criticism of Members' Work

At the Meeting of the Miniature Camera Group of The Royal Photographic Society, held at 16, Prince's Gate, S.W.7, on March 27th Mr. Percy W. Harris, F.R.P.S., in the chair, the usual criticism works in the Members' Exhibition was given. The President of the Society, Mr. D. McMaster, gave the criticism on the technical side on the pictorial side the criticism was given by Mr. J. Dudley Johnston, F.R.P.S. Instead of criticism of the whole of the prints in the Exhibition, certain selected prints were taken, placed in front of the audience and criticisms offered upon them from the two stand-



Sunshine and
Shadow

A. F. R.
Bolton

glance the attitude suggests "want to fight?" It is a very little child study. The arms make a very pleasing angle, but the expression on the face is not caught. I do not like the solid background, and there is a lack of texture in the definition of the frock that is also somewhat unpleasant.

MR. McMASTER: There is no doubt that Mr. Johnston, speaking from a pictorial point of view, has put his finger on one real objection to the print—the background was certainly not in the original print and the crispness in the original could have been reproduced in the enlargement. I imagine, however, that this is deliberate on the part of the author to get a general atmos-

**"Sunshine and Shadow," by
A. F. R. Bolton**

MR. McMASTER: From an examination of the small print it seems evident that the negative must have excellent gradation, it seemed to have every tone in the scale. The outstanding thing about the enlargement is that the author has been able to correct the converging verticals; they are present in the small print, but the author has overcome them in the enlargement.

MR. DUDLEY JOHNSTON: My first impression is that it is purely a matter of pattern, there is a swing of the lines of the architecture up to the top corner which does not seem to be altogether happy. It lacks in concentration, there is no special subject on which the eye can fasten.

**"So You Want to Play?" by H.
Egginton**

MR. DUDLEY JOHNSTON: At first



Decorative
Panel



S. D. Jouhar,
F.R.P.S.

ss. I do compliment the author
aving a very nicely graded
ement and rather a pleasant

**"Roundsman," by W. E. Ball,
A.R.P.S.**

McMASTER: An excellent
cal effect. Again, a section of
gative has been selected and a
sful attempt made to give the
ssion of early morning, with the
hadows and hard lighting. The
r has succeeded to quite an

DUDLEY JOHNSTON: My
ssion, firstly, is that the figure
y well placed, but too much



F. G. Wrigley,
A.R.P.S.

attention has been placed on the
gables. They catch the eye most
strongly when looking at the picture
and take the eye from the figure,
which should be the central subject.
In other respects it is quite good.
The sloping line of the pavement is a
little unfortunate, it might have been
softened in some way with advantage.

**"The Skater," by Dr. S. D.
Jouhar, F.R.P.S.**

MR. DUDLEY JOHNSTON: This is an
action picture in which success
depends upon the quickness of the
eye and hand of the photographer in
seizing the right moment. From the
point of view of expressing action it
is very happy; as a studied composi-
tion it would not be quite so happy,
because the arms and legs are hung



The
Roundsman

W. E. Ball,
A.R.P.S.

out at angles which are not pictorial
or pleasing.

MR. McMASTER: As with almost
all work of this author, the quality is
excellent. The study of the contact
print shows that in the negative a
very high order of gradation has been
obtained, which indicates that the
exposure was just about what it
should have been, and the develop-
ment has brought out that scale. Dr.
Jouhar has left a little haziness which
gives the impression that motion has
been temporarily arrested and that
the figure is not static, but dynamic.

**"Peace," by F. G. Wrigley,
A.R.P.S.**

MR. McMASTER: Very fine
technical achievement; the author
has obtained some transparency into
what might well have been blocked-
up shadows.

MR. DUDLEY JOHNSTON: The title,
"Peace," no doubt is suggested by the
effigy on the tomb, but the most



The Old
Kitchen

W. E. Ball,
A.R.P.S.

striking feature of the picture is the
steps. It is a good technical achieve-
ment, but I am afraid I cannot say
that it stirs or moves me in any way.

**"The Old Kitchen," by W. E.
Ball, A.R.P.S.**

MR. DUDLEY JOHNSTON: My
criticism of this domestic interior
would be that it includes too much.
What the woman is doing is the
subject of the picture, and this plays
too small a part in consideration of
the area included. It is a pleasing
picture with no very high pictorial
merit.

MR. McMASTER: My criticism is
much on the same lines. There is a
good size-negative here, the whole of
which could have been used; the
author chose to cut it, but did not cut
it enough. It is not, however, at all
a bad technical effort as an enlarge-
ment. The job of taking an interior
and making the relationship between



"So you want
to play!"

H. Egginton

the lighting outside and the light inside compatible with what it should be is not easy.

"Gordon Hamilton," by P. W. Harris, F.R.P.S.

MR. McMASTER: This is a straightforward exposure with a straightforward development with gradation, resulting in a good-quality enlargement.

MR. DUDLEY JOHNSTON: It is very obvious that this is either a stage or studio production with a certain amount of artificiality about it. The spot-lighting effect is all very well, but the result is that there is a shadow which catches the eye. It is an excellent piece of photography, and as good a presentation of that subject as you could wish.

MR. McMASTER: The author has captured the texture of the material extremely well.

"Hot Rhythm," by L. T. Hegg

MR. DUDLEY JOHNSTON: I do not like hot rhythm, and I do not think it disposes me to view the picture any more kindly. It is a very muddled piece of composition. The concentration of the light on the face is good, but that is all I can say.

MR. McMASTER: I do not believe that anything like the best has been made of either the original lighting or the quality of the negative in the enlargement. I agree that there is a good deal of confusion, there is not enough separation. A great deal more might have been achieved had the quality in the negative been used to best advantage in the enlargement.

"Candid," by A. B. McGrigor

MR. McMASTER: This is a pretty fair indication of the quality which can be achieved with the small



Spring Morning

H. S. Newcombe, F.R.P.S.

camera when taking an informal portrait, or certain moods depicted at the most felicitous moment. Technically it is excellent, the gradation is so fine that one can see through the dark glasses, and it is so even that the enlargement is not flat.

MR. DUDLEY JOHNSTON: I must confess that I detest "Candid" as much as I detest "Hot Rhythm." What is the object of presenting a young lady in such a disguised and ugly form? I admire the photography, but pictorially—no!

"Wind Coming," by H. S. Newcombe, F.R.P.S.

MR. McMASTER: I do not like this nearly so well technically. The shadows are much too hard and deep, there is no transparency and the print as a whole seems a little muddy. There is quite a lot of life and vitality in the negative, and it does



Wind Coming

H. S. Newcombe, F.R.P.S.



Summer in the Valley

A. E. Gnaegi, A.R.P.S.

snow scene, but I agree with everything that Mr. Johnston has said pictorially.

"Spring Morning," by H. S. Newcombe, F.R.P.S.

MR. DUDLEY JOHNSTON: Mr. Newcombe has certainly made his subject as simple as possible; it is a man-made subject, and I do not know that I think it is very well worth while commemorating. The railings in the background are not a pictorial adjunct, but as an atmospheric rendering it is very good.

MR. McMASTER: It is an excellent representation of a man-made subject. The illusion of depth has been obtained, the quality is good, both in the original negative and in the enlargement.

not seem that the very best has been got from that quality.

MR. DUDLEY JOHNSTON: It certainly appears to be clogged up too much. There are irritating spots of dark scattered in the picture, and the light is such that the eye is swept out of the picture instead of being concentrated in it.

"Snowdon," by W. A. Poucher, F.R.P.S.

MR. DUDLEY JOHNSTON: The upper part of the picture I find very pleasing, but the lower part is distinctly displeasing; it is confused and does not help in any way. A little different viewpoint would have given a better result. It is a very good representation of the snow-clad mountain.

MR. McMASTER: This is beyond doubt an excellent rendition of a



Snowdon

F.R.P.S.

mer in the Valley," by A. E. Gnaegi, A.R.P.S.

McMASTER: I included this as it is one of the few made from a negative, and a great deal of work has been done to get a recession effect and to establish the illusion of depth. In some ways it seems that the effect has been a little overdone. The effect is pleasing, and I think the print has been well done.

DUDLEY JOHNSTON: As a picture I feel it is somewhat unbalanced, there is a mass of cliff on the right-hand side with nothing to balance it on the left-hand side. The distant snow mountains are small and ineffectual. The picture may have had an excellent effect to start with, but it has been ruined by an unpleasant hotch-potch effect by using a paper negative.

Home Front," by A. R. Gnaegi, A.R.P.S.

McMASTER: The particular feature here is that the artist has been able to select a portion of the negative which has been able to concentrate the light to obtain an enlargement of the subject of good quality.

DUDLEY JOHNSTON: It is a good subject, and the feeling is very pictorial. It is well lit and the general lighting is illustrated well on the subject.

Critic," by R. C. Higdon, A.R.P.S.

McMASTER: I wanted to call attention to the contra light effect which has been achieved here. I think it has been carried out very well. The author has obtained a good copy effect by having the subject in the foreground darker than



Leslie I. Higgs

the receding tones. It is a good technical job.

MR. DUDLEY JOHNSTON: I do not think it is successful as a composition. The two figures are an echo of each other, and I think the box is placed unfortunately.

"Customs House, Lynn," by J. St. Aubyn, F.R.P.S.

MR. McMASTER: Each year this author presents a series of Bromoil process pictures, and there is no need for comment. Technically it is excellent.

MR. DUDLEY JOHNSTON: This is a picture one would classify as pictorial-topographical. It is not altogether successful in its lines; the arch of the bridge and the concentration beyond on the lighting of the old cottage is good. It is a nice little picture, but not of very great distinction pictorially.



Candid

A. B. McGrigor

"Eventide," by R. C. Higdon, A.R.P.S.

MR. McMASTER: This is an excellent example of an eventide picture which does not black-out everything. The author has obtained quite a measure of transparency and has given an illusion of depth. Technically it is a very good effort indeed.

MR. DUDLEY JOHNSTON: A picture of this kind always wants colour. I do not know that the boat is quite far enough into the picture to give the best effect, and I certainly think the pall of black overhead is too large and overweighs the upper part of the picture.

"Power," by R. C. Higdon, A.R.P.S.

MR. DUDLEY JOHNSTON: The



Gordon Hamilton as the Dancing Master in "The Rake's Progress"

Percy W. Harris, F.R.P.S.

drawbacks one has to face in photographing this bit of Chelsea are obvious—one cannot select the arrangement of the boats at low tide and it is almost inevitable that one gets an unpleasant spotty effect. The boats are a series of dark blobs on the picture against the pleasant atmospheric effect of the power station in the background with an excellent sky. I think Mr. Higdon has done the best possible with his material.

MR. McMASTER: I agree that the picture has a fine atmosphere. I am not at all sure that there is quite so much evidence of the atmosphere in the negative, and in making the enlargement quite a considerable amount of work has gone into it to give the depth and the pleasing sky. The criticism of the blob effect of the boats is true, but it is a good technical job.

"Autumn," by Dr. S. D. Jouhar, F.R.P.S.

MR. DUDLEY JOHNSTON: I do not like the harsh straight line, there should have been something to break the line of the river bank. There is always a difficulty when two points of light are separated. It is difficult to treat them in such a way that the eye does not wander from one to the other.

MR. McMASTER: Technically this picture is excellent. Dr. Jouhar has only used such portions of the negative as might serve him best, and although I agree that the straight line does make a harsh effect, I think the atmosphere which has been written in to the print is first class.



The Home Front

A. E. Gnaegi, A.R.P.S.



The Critic

R. C. Higdon, A.R.P.S.

"Sunlit Snow," by F. G. Wrigley, A.R.P.S.

MR. MCMASTER: This picture gives all the effect and appeal of snow with one possible drawback. It seemed to me that a mistake had been made in putting the picture on to a warm paper, but when I looked at the title and the lighting I am not at all sure that the author did not do so deliberately. He wanted to get something in the picture of the yellowish light which one encounters in the winter, so I will say it is one of the first-rate technical prints of the show.

MR. DUDLEY JOHNSTON: I cannot conceive why the picture was taken at all! No doubt it is an excellent rendering of snow technically, but such a collection of ugly humps and lumps I have not seen so far in this collection.

"Sand Artist," by C. E. Mennell

MR. MCMASTER: This has some qualities which appeal to many people. As a straight technical representation I consider it excellent, it is sharp and crisp, has gradation to a certain extent, and a picture taken on the sand in sunlight is not easy to obtain without getting it quite harsh.

MR. DUDLEY JOHNSTON: This is a recording of an incident, but it is not interesting pictorially. It might be of interest in a hundred years' time as illustrating one of the curious things which used to happen in the old days.

"Design," by A. E. Gnaegi, A.R.P.S.

MR. DUDLEY JOHNSTON: There is a design of a sort, but it does not appeal to me very strongly. The beauty, if any, in a subject of this kind lies in the exact delineation of

the flowers and the rendering of their texture. It does not come into the pictorial domain at all.

MR. MCMASTER: Technically the picture is good. One suggestion which might be made is that the type of subject would show up better in a slightly warmer tone, either by using an ivory or off-white paper, or by using one of the many papers which give, by a longer development, a warmer tone. Another criticism is that the leaves and flowers have been arranged so that the entire block cannot be photographed without cutting across some line. It would have been better had the picture included the tips of the design. The technical effect would not have been in any way impaired.

"Expectation," by Mrs. Kathleen Fullalove, A.R.P.S.

MR. MCMASTER: This is a very fine technical job, with one exception—I do not like the tone of the print. It is a bit off the normal warm tones, and a little on the "mustard" colour.

MR. DUDLEY JOHNSTON: I do not feel that there is very much to say about it, it is an excellent dog portrait although too much is included. The expressions are excellent.

MR. MCMASTER: Do you agree about that tone?

MR. DUDLEY JOHNSTON: It is a warm tone which is not unpleasant. Perhaps the paper base is not quite right for that subject.

"Otter Swimming Up Stream," by O. G. Pike, F.R.P.S.

MR. MCMASTER: This is an excellent picture from a technical point of view, because it gives the illusion of action. All too often in Nature study pictures the animal is

standing much too placidly, or a bird is static. Mr. Pike has shown his animal in its natural environment, and to that extent he has done the Exhibition a service.

MR. DUDLEY JOHNSTON: The tail catches the eye most strongly in this picture, which I think is not a success from the pictorial point of view.

MR. MCMASTER: The little bit of tail sticking up is very typical of the otter.

"Kitty Makes a Climb," by B. Hutchings, F.R.P.S.

MR. DUDLEY JOHNSTON: I have always thought that we do not cultivate the humorous sufficiently in our pictorial efforts, and here we have an excellent effort to impart a humorous incident into the grim features of the Miniature Camera Group Exhibition.

MR. MCMASTER: Technically, of course, this series is excellent. I was one of the judges of the Exhibition, and we could not avoid grinning when it was put up. Everybody agreed that Mr. Hutchings had branched off into new lines and had done the show a great service in introducing this note. Any one of these pictures would stand enlargement by itself. They are made from first-class negatives. It is a first-rate job, and we hope this type of thing can be introduced to a limited extent each year.

[Reproduced in our April issue, page 131.—Ed., P.J.]

The CHAIRMAN expressed the gratitude of the Group to Mr. McMaster for his remarks on the technical side and to Mr. Dudley Johnston for his kindness in stepping in at the last moment. His complete frankness was appreciated.



Customs House, King's Lynn

John St. Aubyn, F.R.P.S.



Eventide

R. C. Higdon, A.R.P.S.

CATALOGUE:

MINIATURE CAMERA GROUP
MEMBERS' EXHIBITION, 1943

- | | |
|-------------------------|--------------------------------|
| Spring | W. Barber, A.R.P.S. |
| Civic Strength | B. C. English, F.R.P.S. |
| In the Bernese Oberland | H. K. Bourne, A.R.P.S. |
| Sunshine and Shadow | A. F. R. Bolton |
| The Skater | Dr. S. D. Jouhar, F.R.P.S. |
| The Home Front | A. R. Gnaegi, A.R.P.S. |
| A Welsh Farmstead | W. E. Ball, A.R.P.S. |
| "Hello! Grandpop" | C. A. Walker |
| Rodney Maingot | Mrs. K. Fullalove,
A.R.P.S. |
| November Sunshine | H. Egginton |
| Ivory Figurine | R. G. Fennah, F.R.P.S. |
| Brown Off | R. G. Fennah, F.R.P.S. |
| Portrait in Dutch Style | R. G. Fennah, F.R.P.S. |
| Decorative Panel | R. G. Fennah, F.R.P.S. |
| Calm Before the Storm | W. E. Ball, A.R.P.S. |
| Home Guard | P. W. Harris, F.R.P.S. |
| So You Want to Play? | H. Egginton |
| The Roundsman | W. E. Ball, A.R.P.S. |
| Passing Storm | R. M. White, A.R.P.S. |
| Peace | F. G. Wrigley, A.R.P.S. |
| Spotters | F. G. Wrigley, A.R.P.S. |
| The Old Kitchen | W. E. Ball, A.R.P.S. |
| Renunciation | B. C. English, F.R.P.S. |
| Jill | K. Gaseltine, F.R.P.S. |
| Fallen Leaves | A. Blakey |
| B.B.C. | F. Brigham, F.R.P.S. |
| The Critic | R. C. Higdon, A.R.P.S. |
| The Customs House, Lynn | J. St. Aubyn, F.R.P.S. |
| Eventide | R. C. Higdon, A.R.P.S. |
| Evening on the Grimsel | A. G. Gnaegi, A.R.P.S. |
| Power | R. C. Higdon, A.R.P.S. |
| Gordon Hamilton | P. W. Harris, F.R.P.S. |
| Prelate | Mrs. K. Fullalove,
A.R.P.S. |
| Café | F. Brigham, F.R.P.S. |
| English Homes | H. Longbottom |
| Good Companions | L. D. Bellencourt |
| August, 1942 | H. Longbottom |
| Retribution | A. Blakey |



Autumn

S. D. Jouhar, F.R.P.S.

- | | |
|------------------------|-------------------------------|
| 39. Mermaid | P. Shillabeer, F.R.P.S. |
| 40. Hot Rhythm | L. T. Heggs |
| 41. Jean | B. C. English, F.R.P.S. |
| 42. Teddy Won't Smile | F. H. Sharman, A.R.P.S. |
| 43. A Corner in Spring | T. H. Breakell, A.R.P.S. |
| 44. A Lake in Scotland | S. E. Taylor, A.R.P.S. |
| 45. Pantomime | C. E. Mennell |
| 46. Once Upon a Time | L. T. Heggs |
| 47. Candid | A. B. McGrigor |
| 48. Drink Ye All of It | K. F. Rosenberg, A.R.P.S. |
| 49. Summer Clouds | S. E. Taylor, A.R.P.S. |
| 50. Speed | W. Barber, A.R.P.S. |
| 51. The Candidate | G. E. Gaisford, A.R.P.S. |
| 52. Taking It All In | E. F. Woollard |
| 53. Atlantic Rollers | F. H. Sharman, A.R.P.S. |
| 54. Autumn | Dr. S. D. Jouhar,
F.R.P.S. |
| 55. Wind Coming | H. S. Newcombe, F.R.P.S. |
| 56. The Only Child | Dr. S. D. Jouhar,
F.R.P.S. |
| 57. Water Baby | F. H. Sharman, A.R.P.S. |
| 58. Sea and Sky | Dr. S. D. Jouhar,
F.R.P.S. |
| 59. Grace | A. E. Brookes, F.R.P.S. |



Design

A. E. Gnaegi, A.R.P.S.



Sunlit Snow

Fred G. Wrigley, A.R.



"Power"

R. C. Higdon, A.R.P.S.



Sand Artist

C. E. Mannell

- | | |
|-------------------------------|-----------------------------|
| 60. Zillah | K. Gaseltine, F.R.P. |
| 61. Snowdon | W. A. Poucher, F.R. |
| 62. Sunlit Snow | F. G. Wrigley, A.R. |
| 63. Eve's Craft | K. F. Rosenberg, A.R. |
| 64. Yorkshire Tyke | G. E. Gaisford, A.R. |
| 65. Dorothy | G. Newby, F.R.P.S. |
| 66. Spring Morning | H. S. Newcombe, F.R. |
| 67. Summit of Ambition | H. K. Bourne, A.R. |
| 68. A Mountain Stream | W. A. Poucher, F.R. |
| 69. Black and White | G. E. Gaisford, A.R. |
| 70. From the Gold Coast | G. A. Walker |
| 71. Maryl | Col. W. Symon, A.R. |
| 72. Cottage Wherwell | Col. W. Symon, A.R. |
| 73. Cadet Symon, R.O. | Col. W. Symon, A.R. |
| 74. Penguin Parade | Col. W. Symon, A.R. |
| 75. Grasmere | W. A. Poucher, F.R. |
| 76. The Attack | A. E. Brookes, F.R. |
| 77. Sand Artist | C. E. Mannell |
| 78. Glen Afric | J. D. Bettencourt |
| 79. Pamela | P. Shillabeer, F.R.P. |
| 80. Reflections | H. S. Newcombe, F.R. |
| 81. The Yarn Market, Dunster | J. St. Aubyn, F.R.P. |
| 82. T for Two | A. Blakey |
| 83. Evening at Brunnen | Miss J. K. Waddell |
| 84. Distant Rain | A. E. Gnaegi, A.R. |
| 85. Washing Day, Siena | J. St. Aubyn, F.R.P. |
| 86. Lapwing | R. G. Fennah, F.R. |
| 87. Autumn Landscape | F. R. Perkin |
| 88. Sunlight in Borrowdale | W. A. Poucher, F.R. |
| 89. Candid Portrait | J. Queenborough |
| 90. Design | A. E. Gnaegi, A.R. |
| 91. Shadow of Victory | F. G. Mirfield |
| 92. Barren Hills of Snowdonia | W. A. Poucher, F.R. |
| 93. Expectation | Mrs. K. Fullalove, F.R. |
| 94. Kitty Makes a Climb | B. Hutchings, F.R.P. |
| 95. Grace Before Meals | W. S. Pitt, F.R.P.S. |
| 96. Dawn | O. G. Pike, F.R.P.S. |
| 97. Green Tree Frog | W. S. Pitt, F.R.P.S. |
| 98. Otter Swimming Up Stream | O. G. Pike, F.R.P.S. |
| 99. Black-banded Sunfish | W. S. Pitt, F.R.P.S. |
| 100. White-fronted Geese | O. G. Pike, F.R.P.S. |
| 101. Little Smile | J. S. Orme |
| 102. On Guard | C. M. Adcock |
| 103. Our Village Siren | Major N. C. Harbottle, A.R. |
| 104. Wrist Watch Movement | N. Squire, A.R.P.S. |



Expectation

Kathleen Fullalove, F.R.P.S.

- 108. Double Mischief
- 109. District Midwife
- 110. The Alchemist

T. H. Breakell, A.R.P.S.
Dr. G. Gemmill, A.R.P.S.
Dr. G. Gemmill, A.R.P.S.

OF PHOTOGRAPHY

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All correspondence should be addressed to the Honorary Secretary, The London Salon of Photography, 26-27, Conduit Street, London, W.1.

NFERENCE

alars of the pro- available later, but tend the Conference ake their arrange- odation as soon as the last Conference,

held in November, 1942, is now ready at 3s. to members; 6s. to non-members. Communications should be addressed to the General Secretary, Miss E. M. R. Ditmas, ASLIB, 31, Museum Street, London, W.C.1.

LANTERN SLIDES PICTORIAL AND OTHERWISE

By R. R. Rawkins

On January 30th, at a joint meeting of the Birmingham Photographic Society and The Royal Photographic Society, Mr. R. R. Rawkins gave a lecture-demonstration on lantern slide making. He introduced some novel, or not generally known, methods, some of which are fully reported here.

MR. RAWKINS stated emphatically that anyone who can produce a decent print on paper should be able to make a good lantern slide. The chief "snag" is when to stop development, but after making a few slides, this difficulty disappears. At present, there is, unfortunately, no real standard of depth. Lanterns and illuminants differ widely, and the time is ripe for the introduction of a system of measuring the light on the screen and adjusting the illuminant until the light on the screen is a standard of so many foot candles. Some exposure meters are capable of measuring this accurately. In the absence of a system we can only compromise or make our slides to suit the club lantern.

From his visits to many photographic societies, he has had ample proof of the revival of the lantern slide, in spite of the plate shortage. The growing popularity of the $2\frac{1}{4}$ inch square camera, and the $3\frac{1}{4}$ by $2\frac{1}{4}$ size is making contact slides popular.

In his opinion, slides made in the projector by "reduction" are usually better than contact slides, his chief reason being that one can do so much shading or burning-out a projected image. The "placing" of the image when focusing can also be more accurately carried out.

Ilford, Limited, manufacture three distinct types of plate. The "Black-Tone Special," which is made in three grades of contrast—soft, normal and contrasty—all fast bromide plates giving, by normal development, a black image.

The second type is the Warm-Black plate (his favourite), and is much used by slide makers. Somewhat slower than Specials, this plate gives beautiful warm black tones by direct development, whilst the scale of brightness, combined with the long straight-line portion of the emulsion curve, gives results so characteristic of the same firm's Plastika paper.

The Ilford "Alpha" plate has been withdrawn.

The third type is the "Gaslight" plate, suitable only for contact slides. A very useful plate for producing good quality slides from poor negatives.

Amongst the "gadgets" shown, was a useful device made from cardboard, which acts as a plate-holder, a focusing card holder, a "feed" stop and horizon indicator. It is illustrated here (Figs. 1 and 2), and, in addition to being very efficient for straight slides, it is an essential part of the combination printing he was about to describe and to show a number of examples of its work on the screen.

Adding Clouds to Lantern Slides

There are several methods of adding clouds to landscape (bald-headed) slides from a separate negative on a separate plate, but the best and most accurate method is by the use of an extra self-masking slide, used only as a temporary mask when making the separate cloud positive. It necessitates the use of the device Figs. 1 and 2.

The original landscape slide can be made by contact or reduction, but the cloud slide *must* be made by projection. As an essential part of the method is to make two slides of the landscape (one of which is to be used as a mask later), it is absolutely necessary for both of them to be exactly alike as regards placing of the image. The card device, Figs. 1 and 2, has "L"-angle feed-stops for projected slides, but if they are made by contact in a printing frame, some care is necessary to ensure the images being identical.

Here is the procedure in the order of handling when making projected slides for combination with clouds. The device, Fig. 1, is placed, but not fixed, on the projector bed, and the white focusing card, Fig. 2, inserted flush to the feed stop.

The landscape negative (which should have a dense sky) is placed in the projector, the image focused on the $3\frac{1}{4}$ inch square card, shifting about the whole device until the

image is correctly placed, then fix the device to the baseboard with drawing pins, and remove the loose focusing card. We are now ready for ascertaining the exposure. For economy's sake he recommended cutting a lantern plate of the grade chosen into three strips, and exposing one strip in sections of, say, four exposures. This test is developed in the developer until good quality is obtained in at least one of the sections. The time of development to get the quality should be noted, and repeated when making the full slide.

The time required for development will depend, to some extent, upon the variety of plate and the nature and temperature of the developer. Some experience is necessary when producing slides of a very warm tone by direct development, owing to the fact that the exposure has to be very much on the "over" side, followed by development short of finality. The true depth and colour can only be checked up by finally passing them through a lantern.

Having ascertained the exposure for the landscape part, we proceed to expose a lantern plate fully, and if the subject is a particularly attractive one, it is a good plan to make two perfect slides on the same grade of plate. Without disturbing the device, proceed to make the (dense) masking slide by feeding-up to the stops a lantern plate of a greater contrast than the landscape slide. If not available, use a plate of the same grade as the landscape, but overdevelop it in order to obtain the opacity in the darks which is so necessary. If, after development, the whole thing looks flat, treat it as follows:—

After fixing, rinse, and place for a very short time in ferri-hypo reducer, rinse, and apply stronger reducer to the sky part only in order to clear that part. If there is any doubt about the shadows being opaque, the slide can, after clearing, be bleached out with the mercuric intensifier and blackened in ammonia. The slides are then dried.

The landscape negative is removed from the projector and a "cloud" negative substituted.

Take out the pins holding the device, Fig. 1, to the base, place in its proper place the focusing card, Fig. 2, fed flush to the "L"-angle stops. On top of the focusing card place the dense masking slide *film downwards*, also fed flush to the same "L"-angle. Now focus and "place" the cloud forms through the clear glass sky part of the temporary masking slide. Great accuracy is obtained by this method of "placing" the cloud exactly where we want it. Next



combined plate holder, strip tester and horizontal indicator

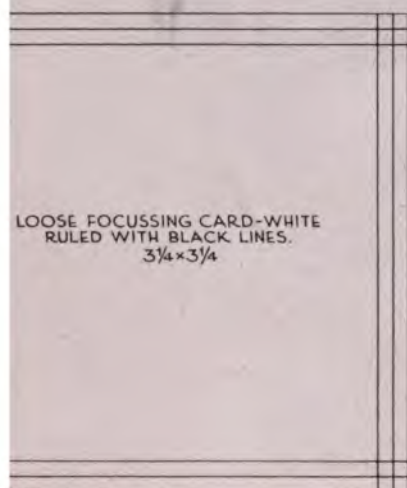


Fig. 2. Focussing Card for placing in device

o lift up the masking slide, if projector light, remove the card and substitute a plate of the same grade as the slide. Note this. "Film so that the slide and the plate are film-to-film.

Now ready for exposing the slide. No shielding need be done as the foreground contains light.

Before switching on the light, press, with the forefinger, on one hand, near the edges of the plate to ensure good contact. If the projector is fitted with a mask (as all enlargers should be), the mask corners can be pressed during the exposure. After the exposure, the under plate is removed and finishing off as

usual, so that, when dry, this cloud positive, with its white silhouette of the trees, is placed in contact, film-to-film, with the original correct-depth landscape slide, and the registration checked. If correct, part the two slides, and, in the four corners of one of them, dab a tiny spot of seccotine on the film side. Now re-assemble and "play" with it until perfect register is obtained. Put under a weight until next day.

No mask must be placed between the plates, otherwise it will interfere with the register, therefore the masking must be done on the outside, preferably with black gummed strips as used for binding. The white spots must also be attached to outside.

The vignette, or softened edge, method of introducing clouds on the same lantern plate, and afterwards bound up with the usual plain cover-glass, is not at all difficult. The device, Fig. 1, makes it very simple by using the "horizon numbers" as shown. The method is as follows: Expose landscape slide as usual, carefully noting the indicating number which corresponds to the horizon on the landscape; do not develop it, but remove

it from the device whilst the landscape negative is being substituted by the negative of the cloud. The image of the cloud is "placed" suitably on the card, Fig. 2, bearing in mind the horizon number, the card removed, and the light switched off. The exposed landscape slide is then placed to the feed-stops, and the exposure made in the same way as one would do on paper, viz., by shielding with a card, taking care to expose the cloud a trifle over the horizon part. If this is not done a "halo" on the horizon will be obtained. By this method there is no risk of obtaining different colours of image as in the separate plate method.

Another simple and popular method of introducing clouds on a

separate plate is by printing or vignetting the edges, or by locally reducing the lower part of a sky positive with ferri-hypo. This ferri-hypo softened edge method is made more simple by printing the landscape as usual (keeping sky clean), making the cloud positive so that the cloud forms come slightly lower than the horizon, place the wet slides back to back with the cloud positive uppermost, and apply the reducer to the top slide so as to clear away, with a softened edge, the part of the cloud not wanted. When the two slides are dried and placed film to film, there should be no line or halo visible.

General Hints

In the practical demonstration which Mr. Rawkins gave, he developed some exposures on the Ilford Warm-Black plate, using the developer as recommended by the makers. He stressed the necessity for very careful handling at all stages so as to prevent spots and scratches.

The exposing light used for contact printing should be changed according to the plate used. He recommended the following:—

25 watt for Black-Tone Specials; 50 watt for Warm-Black plates; 150 watt for Gaslight plates.

Pinholes or spots in slides were difficult to eradicate, but he got the best results by using diluted bromoil inks applied with a fine spotting brush.

Toning by after-treatment was fully illustrated by examples, a favourite being the chromium bleach, followed by some developing or blackening agent. This method enables one to obtain a warm tone without any intensification effect, or to get considerable intensification by altering the proportion of acid content. The less the acid, the more intensification.

Sulphide toning was dealt with. The Black-Tone Specials were suitable for this toning, but the Warm-Black and Gaslight slides gave better results by a partial bleach method.

For beautiful blue-black tones, very similar to the thiocarbamide method, he uses the old gold and sulphocyanide bath as used for P.O.P. The quality of the slides thus treated was very rich.

As regards masking, he preferred to build up his mask by using the ordinary black binding strips, plus a small celluloid set square.

Finally, a number of slides of a pictorial nature were shown, followed by several slides made and exhibited in 1900, showing no trace of tarnish or fading.



A. The landscape slide of correct depth. B. An exact duplicate of A but made in a contrasty plate. (This is the masking plate through which the cloud image is focussed and exposed). C. The cloud plate exposed and developed. D. The finished slide made up of A and C registered and fastened together

Tinted Cover Glasses

Mr. Rawkins showed a number of slides which had been dye-tinted, and said that in the early days of the cinema it was the practice to use blue-tinted stock for "moonlight" effects, yellow for sunshine, and tangerine for sunny eastern scenes. In many of his slides shown were examples, comparative and otherwise, of tinted cover glasses or slides. Since we frequently use for our pictorial work on paper a cream base instead of white, there is no reason why we should not apply the method to lantern slides. There is nothing here of the hand-tinted slide idea, yet he has frequently had slides rejected because of the tint, which was regarded as "not photography," but of late years some of the judges have relented, and in the last R.P.S. Exhibition there were several examples which were dyed.

The dyes used are very cheap, and may be purchased from Woolworths at a few pence per carton, under the name of "Jiffy" dyes. The contents of a carton is dissolved in hot water and used when cool. One carton is sufficient for one pint of water, and the solution can be used over and over again. The colours found most useful are tangerine, yellow, pink, saxe blue and emerald green.

Whilst it is possible to dye the actual slide itself, the better method is to dye a gelatinised cover-glass. Every enthusiastic slide maker has spoiled slides, or those which are not up to standard, and these should be soaked in water for a few minutes, followed by a short immersion in plain hypo solution, four in twenty, and, finally, treated to the reducing action of the Howard Farmer or ferri-hypo reducer so as to dissolve all traces of the image, leaving a perfectly

clear gelatin-coated plate. These glasses should be dried and stored in a grooved box or interleaved between tissue paper. It is a good plan to dye a number of plates in each colour, dry them and have a set at hand to "try out" the effect on the particular slide being produced.

The method of using the dye is important. The dry cover-glass, or the slide, should be soaked in plain water for one minute, removed, drained, slightly rinsed under the tap, wiped off, and immersed in the dye for two or three minutes, rinsed and dried. As regards the depth of colour, it is best to try out the solution on a waste slide, but bear in mind that the colour dries darker than when wet. If too deep, the plate can be washed to remove some of the colour. It must be understood that the colours must not be deeply dyed, or an artificial look will appear and defeat the success of the method.

A slight tint gives the most satis-

factory result, curiously like Mordanting method, and the lights do not appear to be tinted viewed on the screen. The effect the base tone is extraordinary black tone slide dyed in emerald green gives it the appearance of a slide toned by chemical means as the Burroughs Wellcome toner. Similarly, a warm-toned on the Ilford Warm-Black appears much warmer when dyed tangerine. A slide of a but primroses growing naturally very effective when dyed in yellow. Another very valuable point of



D.

slides will interest the picture worker who inserts clouds in a separate negative on a separate lantern plate. In making warm slides, there is often a difficulty matching the colour of the deep both plates, but if one of the plates dyed there is a general evening of the colours.

Although the colours can be applied locally in the same way as hand-slides, this method is certainly suitable for pictorial work.

To sum up, the chief items to make for success are the preliminary soak in water before dyeing to a perfectly even tint, avoid too long a dye solution or too long a time in it, and, finally, the choice of colour for the particular subject.

THE EXPOSURE METER AND THE PICTORIAL PHOTOGRAPHER

By Percy W. Harris, F.R.P.S.

A meeting arranged by the Pictorial Group of The Royal Photographic Society was held on Saturday, January 9th, 1943, at 16, Prince's Gate, S.W.7, when Mr. Percy W. Harris, F.R.P.S., gave a talk on "The Exposure Meter and the Pictorial Photographer." The President, Mr. D. McMaster, was in the chair.

HARRIS said: The first reason why I want to talk about exposure meters and the pictorialist is because most of what has been written is purely technical, and not necessarily related to pictorial work. Pictorialists seem to think that the exposure meter is something the use of which hinders or inhibits

that they were the kind of negatives he liked and he did not bother to print them!

The record photographer has, on the other hand, to take a picture as objectively as possible, and his requirements are, generally speaking, a negative which is sharp, well-defined, and with a good range of tones, representing as far as possible the tones of the original. The negative has to be developed to suit the particular process he is going to use. One might reasonably expect that half-a-dozen record photographers taking the same scene would produce half-a-dozen prints practically indistinguishable from one another. The pictorialist, for his part, generally has in mind an idea of what his final picture is to be. As an artist, the pictorial photographer is aiming to produce a picture which should be an expression of his own feelings. It should create in the observer similar emotions to those evoked by the scene itself, or by the thought which he is endeavouring to interpret. In many ways his aims and methods are similar to those of a painter.

Photography is a far less flexible medium than the painter's brush, but it still has a good deal of flexibility, and enables the artist to express himself in many ways. For example, the work of any of the leading pictorialists can be recognised, irrespective of the subject. One feels that there is an artist behind it. Sir Charles Holmes, in his well-known book, "Notes on the Science of Picture Making," indicates that a good picture should have the four qualities of unity, vitality, infinity, and repose. The painter, for his part, can imagine a scene or view one before him and translate it into a picture, modifying it so as to get his unity, vitality and repose by varying the composition and the relation of the tone and colour values. He can alter the position of anything to suit his requirements. The photographer, on the other hand, is limited, although he can choose his viewpoint, time of day, the lighting, and so forth, in the production of the negative. He can also do much in the production of the final print, and if he has clearly in mind what he wants to achieve he certainly should have equally clearly in mind the type of negative he wishes to produce, which may be quite different from that which the record photographer desires to make. In obtaining unity he may decide to concentrate attention on the highlights, sacrificing the shadows. To do this will perhaps accentuate the highlights. If the shadow detail plays an important part in his scheme of things, he may expose the shadow detail and let the high-



Driffeld Actinograph, marketed in considerable numbers in 1889 and the next few years

istic judgment; that to use it indicates a lack of judgment on their part, and, therefore, if it is used at all be brought out furtively! All of us know the list on an excursion, who slips the exposure meter in his pocket, behind a tree, hoping no one will see he is observed, he says apologetically, "Oh, I am just looking out this thing, seeing how it compares with my judgment. It's pretty accurate."

The use of a meter need not indicate lack of knowledge on the part of the person using it, and the thought does not seem to be that so many purveyors of meters have made exaggerated claims for them. The photo-electric type of meter is not absolutely automatic, but is a useful tool if used intelligently; by other accessories it is a good walking stick but not a crutch.

The type of negative which the pictorialist wishes to produce is something in which there should be an attempt to express his own individuality on the path towards the final print. We must never forget it is the final print on which the picture shall be judged. The negative is only a means to an end. Many photographers seem not to get beyond the negative. One man used to show me his negatives, and when I asked to see the prints he merely remarked



The Zeiss Diaphot, an early visual meter with a rotating wedge



The Justophot, one of the first really popular visual meters



The Justodrem, a popular visual meter and an improvement on the Justophot in ease of handling

lights take care of themselves, even deliberately halating them.

We know that there are limitations in the materials we use. All photography is a convention; we have a three-dimensional subject in full colour which we translate into a two-dimensional picture in monochrome. There are limitations in what we can reproduce. We have to take into account the deepest shadows and the highest lights, and in our final print these brightness variations have to be translated into a pleasing if not necessarily accurate scale of gradations which give an impression of verisimilitude. But the limits are definitely small, or at least very rigid. The brightest reproduction we can obtain is obviously the highest reflection from the white paper, and equally the deepest shadow is the minimum reflection from that paper; it is not always realised that only a comparatively limited scale of reproduction is possible. So far as the deepest black is concerned, glossy paper will give the deepest black we can get. The "velvet" types of paper, of which the best is Gevaluxe, reflect very little, and give a rich, deep black, while a matt paper gives a relatively poor black, so that if you get the deepest possible black on a matt paper and compare it with the deepest black on the glossy paper you will find that the matt paper black is distinctly grey in comparison. Yet in spite of this, a matt paper print may still be artistically pleasing.

It is well to consider some of our light problems in the subject itself. The human eye is an accommodating piece of apparatus. For example, we can walk into bright sunlight and view a scene in great detail in both highlights and shadows, and a moment later enter a dark room, which at first appears pitch black. After a few minutes much detail can be observed, and still later the room seems reasonably light. In the bright light the pupil of the eye is contracted, but on entering the dark room the pupil or eye aperture expands. The expansion of the pupil changes the eye sensitivity quite considerably, but not to the extent which most people imagine, the greatest accommodation by far occurs in the retina itself. The change is fairly gradual—it varies between individuals. That is why, if we go from bright sunlight into a dark room it takes several minutes to adjust ourselves to the light, for the sensitivity of the retina is gradually increasing.

This change is a very important factor when we go to the question of the human judgment of the brightness of light. Modern emulsions are capable of recording a wide range of brightnesses—a modern emulsion give anything up to about 150-1 ratio with a fair degree of accuracy. Thus, if the feeblest amount of light will just record itself on the emulsion is 1 unit, then 150 units of light will give the deepest black in negative.

The average every-day subject to be photographed is contrary to most opinions, not of a very wide range of brightness. Excluding a bright sky at midday in summer, I doubt whether many landscape subjects exceed a range of 30-1, and that would be considerably contrasty. In portraiture a range of only 4-1 is quite usual. Outdoor scenes of 10-1 look quite good.

Now emulsion can take care of anything up to with ease. That being so, we have to consider exposure problems not what may be called an exposure but a practical exposure.

I will give you one or two examples of what I mean. Let us imagine that we have a scene with 30-1 range on an emulsion with a range of 150-1. We can expose two ways: we can arrange, for example, to give the minimum exposure which will reproduce shadow accurately; we can also, at the other end of the exposure for the highlights, that is, give an exposure that the brightest highlight will not quite reach, or just touch, the maximum opacity which we can get. An exposure can be given which will blacken all the silver in the emulsion, and if the next exposure is only half that value the opacity will drop proportionately, and before, the proportion of highlight to shadow remain the same. If a further exposure is double the highest highlight will have already been given the minimum, and the next highest light may reach just as an opacity. This would mean over-exposure and a gradation in the highlights.

Let us imagine we have exposed our film so that the brightest light just reaches the maximum blackness in the 30-1 range. If we give a fifth of that exposure we still get a perfect negative, for at the other end of the scale enough exposure will have been given to obtain shadow detail, so that in a subject range of 30-1 the 5-1 latitude in exposure. This rule must be modified in miniature work because the emulsion has a thickness and a certain degree of opalescence which spreads



Edge view of the Leudi, an inexpensive and exceedingly small visual meter. The figures get progressively darker from right to left. The last figure can just be read is taken as the index



spoplex. Although at first glance this might be taken to be a metric meter, it is actually a visual meter. The knurled ring varies the brightness of a series of figures observed through the eyepiece, and the calculator allows for various stops and speeds of film

the emulsion. Under high degrees of magnification shall not get such a sharp image on a full exposure as a medium exposure. This question of thickness of emulsion has proved to be of some importance in the past years. When in the experimental work necessary to produce colour films it was found necessary to make thin emulsions, it was discovered that such emulsions could be used very successfully in normal photography. While not having such latitude, they gave a greater sharpness. Before the war we had emulsions which gave astounding definition.

When I first tried out these new emulsions I discovered the previous limits of the enlargement in my photographs were due to image spreading of emulsion, much to lens definition, and with the thin layer got a much better definition. These films have been invaluable during the war, owing to the necessity for sharpness of definition in documentary work on 35 mm. films.

Technical requirements of the pictorialist are not really those of the record worker. The pictorialist chooses the particular scene he wishes to translate into a photograph and chooses what part of the subject he wishes to include. Therefore, in my opinion, a pictorialist must pay special attention to making the exposure according to his particular artistic instincts. In a narrow subject, such as portraiture (which, nevertheless, includes both narrow and wide ranges of exposure), modifications of the negative can be made afterwards so as to achieve the desired result, but it is much better to aim at a particular type of negative from the beginning.

As far as outdoor exposure is concerned, we must remember that there are comparatively few factors which influence it. Assuming a bright, clear sky, there are variations between summer and winter light for the same time of day of 4-1. We next have variations of light of the sky, which cover a range of 6-1 in the run of tables, so that if you compare a clear sky at midsummer with an overcast sky at noon in winter, a range of light of 24-1 will be found. The veriest beginner could never confuse the amount of light from a clear summer sky with that from a cloudy sky in mid-winter. In outdoor work, with a certain limited range of exposure in landscape work, it is not difficult for the amateur to estimate light values within 200 or 300 per cent, many people having reached the conclusion that an amateur judge exposures very accurately all the time.

We look upon exposure meters and scales as comparatively modern inventions, yet Hurter and Driffield wrote practically all that could be written on the question of measurement of exposures as long ago as 1888. Those who have used exposure calculators and meters may be interested to see the Hurter and Driffield Actinometer, which was patented in June, 1888. It is surprising to find how many things which are regarded as new were known to Hurter and Driffield. The H. & D. meter consists of a cylinder round which is wrapped a piece of paper on which are printed a number of curves for various times of the day. On the periphery are divisions for months, divided into sub-divisions of ten days. If the cylinder is turned to the particular month and sub-division, and a line chosen for the particular time of day, the upper slide can be moved until the stop chosen comes against the chosen line. Against each stop there are three figures, because Hurter and Driffield found on measurement that the light transmitted by a single lens was greater than the light transmitted by a double or a triple lens. We know that the absorption power of multiple lenses is considerable, and that there is a loss of light on each change from glass to air or air to glass. In some of the modern lenses the efficiency may be as low as 60 per cent. The inventors allowed for three different efficiencies of transmission in this early meter. A further slide was set for the emulsion speed, and the exposure could then be read off. The patent specification, and a paper read by Mr. Driffield, before the Liverpool Amateur Photographic Society, are published by The Royal Photographic Society in the H. & D. Memorial volume.

Following this there came a number of calculators of various sorts—Howard Farmer produced one, and many other well-known workers tried out various forms. Then we had the Watkins meter and a whole series based on it, depending on the darkening of sensitised paper. Watkins was a miller, who was also a very keen amateur photographer, and his meter contained an aperture, half of which was covered with a permanent blue-grey tint, and the sensitive paper behind was a lemon yellow. As it was exposed to the light this paper darkened, and when it matched the tinted paper the time taken to reach this tint was noted. This method measured the light falling on the meter, the meter being in the position of the subject. This, of course, took into account the variations of the light according to the time of the day, year, and the sky covering. The exposure indicated was generally doubled by users. It did not take into account the type of subject. Then there was the Wynne meter, based on the same principle, but with a somewhat different calculator. The Imperial Dry Plate Co. (now incorporated with Ilford, Ltd.), brought out a similar calculator.

Another series of meters was then evolved, of which the Zeiss Diaphot is typical. This, as you will see, consists of a disc of glass with a graduated wedge behind it. There is a "window" covered with blue glass, the idea of this being to reduce the picture at which one is looking to a monochrome tint. The wedge is moved in front of the window and turned round until the shadow detail disappears; the exposure is then read off on the dial. The weak-



The Practos. A good type of visual meter in which the field of view is seen as well as the graduated numbers



The Avo, a famous British made meter, follows the general practice of measuring the reflected light



The Smethurst-Avo meter. This modification of the Avo works by the incident light or "high-light" method, which has proved so successful with reversal films (Agfacolor, Dufaycolor and Kodachrome)

ness of this meter is its dependence on the human eye. Eyes differ considerably in their sensitivity and power of accommodation. As far as I am personally concerned, practically every visual meter I have tried is useless. The Zeiss is quite a simple form, but we have also had a whole series of quite elaborate visual meters. There is one here which uses the wedge method, but instead of looking at any part of the subject we point the meter towards the subject and look into it. It has ground glass or opal fitted inside, and we see a series of figures; the lowest figure that can just be read is noted and the exposure read off from a calculator.

Another series, less well known, endeavoured to match the illumination of the subject against a constant light. Bell and Howell, in 1925, produced one, at one end of which is a small cell and lamp, the lamp being covered with blue glass to match daylight. There is also a reflecting prism. One looks through a window at the subject, the lamp filament appearing in the field of view. The strength of the light is varied by a resistance, and when the filament brightness matches the subject the exposure is read off. Theoretically it sounds attractive. In practice it is good in dull light, but when attempting to use it in the States some years ago, particularly on bright summer days, I found that I could not get any accurate reading at all.

Some years later a member of the Society, Mr. Anger

Hall, produced what is probably the most accurate exposure meter ever invented, with an enormous light range. The idea here was similar to that of the Bell and Howell, but greatly improved. It has never been marketed commercially, although several have been made up; it is not everybody's instrument, but it enables the serious photographer to do all kinds of work which normally could not be accomplished. It is an interesting example of a light-measuring instrument, and a new method of measuring exposure.

Round about 1930 we had the first photo-electric exposure meter, marketed by the Weston Electric Co., America. This was hailed, rather too optimistically, as the solution of all exposure problems. The photo-electric meter can take many forms, but essentially it is simple. There is a cell surface which, when light falls upon it, produces a difference of electric potential between front and back. If we connect a measuring instrument to it we shall find that the current which flows through the meter is proportional to the light over a wide range.

The first meters consisted of nothing more than a cell with a measuring instrument, and they were faced towards the subject. The greater the amount of light reflected from the subject the bigger was the meter reading. This was calibrated in light units, with a circular calculator on the body of the meter for ascertaining the exposure.

Then we had a whole series of meters which were supposed to be "direct" reading. They were direct reading only in a limited way, and only for certain stops or speeds. For other stops and speeds some form of calculator had to be used. I still feel that the best type is one in which the light is measured in light units which can be converted into exposure with a simple calculator.

The generally accepted but thoroughly unscientific method of using a photo-electric meter is to face it towards the subject, and it is on this point that so much nonsense has been written. Very few people realise that a meter is calibrated on the assumption that the light reaching the cell comes from only the same area as the light reaching the photographic lens, which is rarely the case; it is calibrated on the assumption that all subjects have the same proportion of light and shadow, which is also rarely the case; it is calibrated on the assumption that marked shutter speeds are true speeds, which is



The British-made Metrovick meter, showing conversion scale on flip-up lever-ready case



The Weston "Master" meter, the latest model of this well-known make. It is distinguished by its small acceptance angle (only 30°) coupled with high sensitivity



x, one of the most sensitive of the wide-angled meters



The Excelsior F.E. meter

never the case, and that the meter will be held in such a way as not to include more bright sky than is required. Now the average ordinary hand camera has an acceptance angle of roughly 60 degrees. If the meter happens to have an acceptance angle of 60 degrees in all directions, both meter and lens would cover the same area, provided a circular plate was being used. But very few meters have anything like so small an angle as the photographic lens.

You might ask why these photo-electric exposure meters differ so much. The answer

t the most expensive part of the appliance is the measuring instrument. The bigger the angle of tance the more light is picked up and the less ive the instrument needs to be. That is why some a wide angle of acceptance.

ing to the question of the light range, these meters ge the light and are calibrated on the assumption he average subject has a light distribution of 50 per ight and 50 per cent shade. How fallacious this ption can be you will appreciate by thinking of a scene at a garden party.—a green lawn with trees l, no sky included, and a group of people dressed illy—men in morning coats and ladies dressed in own. We take a reading and get, say, 1/25th sec. film is correctly exposed we shall get good shadow

But if into the foreground there walks a lady in a crinoline dress the total amount of light reflected o up considerably and the exposure will drop to ps 1/50th sec. Yet the need of reproducing shadow in the trees has not altered, and there is no reason ducing the exposure for this shadow detail. The re should be the same in both cases, but, thanks to itude of the film, both exposures will probably give y good negatives. That is an example of how the e of light values may change, and the total amount t reflected from the subject increase. Such matters rely dealt with in any of the instruction books. are, however, two booklets which deal with the t properly, one of which is that issued by the m Company, and the other by the General Electric any, of America. The Weston book indicates types oject which require half the reading, and others require double the reading, and does not claim that hing in front of the meter must automatically give ect response, nor do the makers recommend the l or integrating method of measuring the light. To e meter to best advantage, and control it in the d manner, the integrating method should not be ed.

re are several other ways of using a meter, one of is known as the deepest shadow method. The

reading can be taken in the deepest shadow part of the scene, when a tenth of the normal reading will be correct, or, at the other end of the scale, if a measurement of the brightest highlight is taken, and the normal exposure increased ten times, it will correct, provided the subject range is not too big. On looking at the meter readings for the two light values the tone range of the subject can be measured. As previously stated, the brightness range of the subject is something which is usually quite small compared with the brightness range of the film.

These, then, are two important methods of using the meter. By measuring the extremes of the illuminated range (the deepest shadow and the brightest highlight) any variations in the light proportions of the scene will be taken care of, and will not affect the exposure required for detail in the deepest shadow at one end, or in the highlights at the other.

Another method is an artificial highlight method in which we take a reading off a white card. So far I have not said anything about exposure meters for portraiture work in artificial light. In artificial light we are dealing with values which are quite low, even when using a photo-flood. Working at home in the ordinary-room illumination the light seems quite good, and if we put in a couple of photo-floods the light seems enormous, yet it is poor compared with sunlight. To give some idea of comparative light values, the reflection from a bright sky gives up to 1,600 ft. candles. A 1,000 candle-power lamp, held one foot away from one's face, would seem tremendous illumination, but it is no more than we get in good daylight! In the studio there is often so little light reflected off a subject that it is difficult to get any reading at all on many meters. The over-all or integrating method which I have mentioned can be very misleading and give quite wrong readings in artificial light. Take the case of a girl sitter who changes from an all-black to an all-white outfit. We should concentrate on skin rendering and the exposure we give should be based on the values for the face; unless the lighting is extremely contrasty, we should not vary our exposure much between the white dress and the black dress subject. With the photo-electric meter used for over-all measurement the amount of variation of light will be enormous, because a high proportion of the total light will come from the white dress.

I very much prefer to take my measurements from a white card held near the subject's face, allowing the light to fall upon it, and measuring it from such a distance that the meter includes nothing more than the white card; with a few experiments it is possible to find a correcting



The Tempiphot, a highly sensitive meter with a very wide acceptance angle



The American G.E. meter. This is calibrated for both incident and reflected light. It also has a small acceptance angle combined with high sensitivity

factor which gives the right exposure. In portraiture it is very useful to take a reading from a white card held where the model's face will be, giving ten times the indicated exposure.

It is possible also to calibrate a meter, not for reflected light but for incident light, and that is one of the interesting features of the new American General Electric meter, which I have here. The General Electric and the Weston meters are the two popular meters in the United States, and they are calibrated in a similar manner, that is, in light values. The Weston Master meter has two ranges. When the cover flap is closed it has a bright light range which runs up to 1,600 foot candles, and at its dull-light setting with the flap open it is calibrated for very small values from .2 of a foot candle up to 50. When the flap is open it automatically alters the meter scale. There is a simple calculator with which the light reading can be converted to exposure at any film speed or stop.

The General Electric meter is also calibrated in light units. For bright light the acceptance angle is 30 degrees horizontally and 50 degrees vertically. For dull light a flap is opened, increasing the sensitivity, and for very poor light the cell is used for incident light, being placed in the position of the subject facing the light. With a meter of this degree of sensitivity the field is opened wide for all kinds of accurate work by the pictorialist.

A further problem is the question of meter ratings. Unfortunately, meter manufacturers and film manufacturers do not necessarily see eye to eye. In fairness to the film manufacturer, it should be said that he is out to give an indication of the maximum speeds when his films are treated as he thinks they should be treated, developed with developers which he has worked out for them, and to a certain degree of contrast. The negatives so produced are not necessarily of the finest grain, and many amateurs like a fairly thin negative, to use certain developers and to introduce all kinds of variations. To get the highest speeds with modern emulsions they have to be developed to a degree of contrast which many people think is too hard for their particular form of enlarging. All this has to be taken into account; how, therefore, is the meter manufacturer to calibrate his meter? I have found that if a half-a-dozen makes are all faced towards the same subject and all set to the same nominal film speed quite different readings are obtained. I have tried to bring all meters down to a common datum line, and have published figures which have been found, by practical trial, to be good for particular makes of film. This means that the same film has different speed settings for different makes of meter. Kodak and Ilford have published tables in their literature which give the readings for various makes of meter, but the best method of all is to calibrate one's own. Most of us have settled down to our own developers, enlargers and printing processes, and if you want to know the speed of a film for your meter give a series of exposures and see which gives the best printing value and best type of negative, and then see which speed setting gave that negative.

I hope I have indicated most of the features which we should bear in mind if we are to get the negatives we want. The meter does not think for you, you must spend time with it, and the more time and thought devoted to it the better. Many pictorialists do most of their work with landscape in fairly uniform conditions, and can estimate the exposures necessary; to such people, save for exceptional use, a meter may be rather a luxury, but very few of us are so experienced. If we have a photo-electric meter we must learn to understand it. We should calibrate it ourselves, and use it as a light measuring instrument, not as a magic cure-all for exposure problems.

Use it with discretion and it will be a great help, a save you a good deal of film.

Discussion.

Asked if the electric current generating cell was to deteriorate in time or because of use, Mr. HARRIS there were only two types of cell in this instrument. There was one made of a sheet of iron, coated with selenium, and with a very thin transparent coat of gold on top to act as one conductor, the iron acting as the conductor on the other side. Then there was a copper oxide cell, which was used in the Weston meter and in the General Electric instrument. In the Weston meter there was a coating of copper oxide on copper. The selenium cell was far more sensitive than the copper oxide cell but the latter was much more robust. The General Electric and the Weston meters were the only ones that had this copper oxide cell; it was exceedingly sensitive. All the other meters, while being sensitive and accurate when used carefully and in good conditions, could deteriorate if abused. If they were left open to sunlight they might be ruined in half-an-hour, and if left open for only a short time in bright sunlight might drop in sensitivity from one-half to one-third. In the copper oxide cell there was no noticeable deterioration over many years, even when exposed to sunlight. There would not be much risk of deterioration in the selenium cell if it was only opened when in use.

Confirming the lecturer's remarks about light meters, Wing-Commander BELLAIRS remarked that he had found a contrast range from bright sunlight on the roof of a building in the Sudan to the light in the deep shadow of a building and found that it was only 150-1.

Replying to a member who asked if the meters were procurable at present, Mr. HARRIS said that Weston meters had been imported since the war, a General Electric meter being sent to him as a present a few weeks before. About 25 Weston Master meters had been imported into the country just after the war, but his was the only American General Electric meter he knew of in the country.

Mr. WESTON said he had one of the earliest light meters, and recently found that the action of the selenium cell was very slow at the start and after exposure it gradually returned to zero. Did that indicate that the selenium cell was deteriorating?

Mr. HARRIS thought it was probably due to a poor contact.

The PRESIDENT said that he did a lot of work in connection with Dr. Weston of the Weston Electric Co., and that the Weston tried to build into a small unit of light measurement this just as good a piece of equipment as if it was a powerful unit. The selenium-iron-gold combination was mainly German, and was much more likely to deteriorate than the copper oxide type.

Asked the colour sensitivity of the selenium cell, Mr. HARRIS replied that the colour sensitivity of the selenium cell and the copper oxide cell were not quite the same, but near enough to one another in practice. Roughly speaking, the colour sensitivity of the copper oxide cell was similar to that of the modern panchromatic film. The selenium cell could sometimes give the quite wrong reading when used with ortho film, for the meters were red sensitive and ortho film was not.

The PRESIDENT expressed the thanks of the Society to Mr. Harris for his talk. He had taken a good deal of trouble, and he knew how true Mr. Harris's statements were. There were not many people who could bring both the technical and pictorial aspects of the subject together as Mr. Harris had done.

ESTIMATION OF PRINT GRAININESS FROM MEASUREMENTS ON THE NEGATIVE MATERIAL*

By E. W. H. Selwyn, F.R.P.S.

The term "granularity" is adopted for the statistical variation of density over the surface of photographic materials, and "graininess" for the visual appearance, including the effect of high density in reducing the brightness and thereby the acuity of the eye. It has been shown that the granularity of samples of negative materials, the graininess of prints made from them, as measured by the distance at which their graininess disappears, and visual estimates of the graininess of the prints show a degree of correlation consistent with the errors of the observations. The granularity of a print is proportional, and probably equal to the product of the granularity of the negative and the slope of the characteristic curve of the paper. Thus, if tone-reproduction were perfect, the granularity of a print would be proportional to the granularity of the negative divided by the slope of the characteristic curve of the negative, at the point leading to the particular density of the print under examination. But tone reproduction is not perfect, and the graininess is diminished at the higher densities of the print by the lower acuity of the eye at those densities. This leads to a maximum in the print graininess of Jones' "first excellent" print at a point on the negative characteristic curve 1 log. exposure unit above Jones' speed point. It is suggested, therefore, that the graininess of negative materials be specified, for pictorial purposes, as the quotient of the granularity by the slope of the characteristic curve at a point 1 log. exposure unit above Jones' 0.3G point. The suitability of this measurement has been checked by direct experimental tests on prints.

For other than technical purposes, when it is often convenient to make observations directly from the negative, the graininess of the negative is of no great importance, except for the extent to

1. Introduction which it determines the graininess of the print made from it. What we really require to know is the graininess of the print. The importance of this aspect of the measurement of graininess was recognised in the early measurements of graininess by Jones and Hardy (1). Interpretation of the relations between the graininess of the negative and that of the positive did not seem to be possible on the basis of their measurements, but it should be noted that the method of measuring the graininess of motion picture prints adopted by Jones and Hardy is almost beyond criticism. Naturally, the graininess of a given print depends on some property of the negative material, and also on the properties of the printing medium and the way in which the print is made. If the property of the negative material which is important in this respect is to be determined, it is necessary to adopt some standard printing process, in just the same way that a standard printing process is adopted for measurement of the speed of negative material.

standardisation of the printing process implies standardisation of the negative in a way to suit the printing process. At first sight, therefore, it would be necessary to make a print in a standardised way, from a standard negative, and to measure the graininess of the print. Thus, the negative standardised by Jones (2), as that leading to a "first excellent" print, and the "first excellent" print obtained from it might be adopted. Printing to a sensitometric specification is, in the ordinary way, not easy, however, and it would be much more convenient to be able to deduce the graininess of a print from the graininess of the negative rather than to be forced to make a print from the negative and measure the graininess of that. Thus, the object of this work was to find out to what extent such a simplification is possible.

It has been found convenient to adopt the terms "granularity" and "graininess" in much the same sense as those defined by Lowry (3). Thus, granularity is adopted as an expression for physical measurements of the statistical fluctuation of density over the area of photographic material, and, in particular, in this paper, it will be used as an alternative to the symbol G_0 in the previous paper (4). It was therefore assumed that the material is scanned by a camera, the area of area a , the standard deviation of the densities so measured, multiplied by \sqrt{a} is approximately independent of the size of a and characteristic of

the sample of material in question. G_0 is the value of this quantity for very small values of a .

The term graininess is used, as Jones and Deisch (5) defined it, for "the sensation or impression of non-uniformity in a photographic deposit produced upon the consciousness of the observer when such a deposit is viewed." The acuity of the eye is dependent upon the brightness of the subject looked at, and therefore upon the density of the print, and the graininess will, therefore, vary with the density of the print. This effect is taken to be included in the term graininess. It is also convenient, sometimes, to use the word graininess to cover both graininess and granularity.

If consideration is confined for the moment to granularity, it will be obvious that if the resolving power of the printing medium is high enough, and if the granularity of the printing medium is negligible, the granularity of the negative material will be transferred to the print. If M is the magnification of the negative, the granularity of which is G_0 , it may be assumed that the granularity in the image on the printing paper, due to the negative, will be M/G_0 , and that on developing, the granularity in the print will be $\gamma_p M/G_0$ where γ_p is the slope of the characteristic curve of the paper at the point at which the print is made. If G_p is the granularity of the printing paper, then by the usual law of

*Communication H.891 from the Research Laboratories, Harrow.

addition of quantities following Gaussian distributions, which granularity is known to follow (4), the granularity of the print will be

$$\sqrt{\gamma_p^2 M^2 G_n^2 + G_p^2}$$

or

$$\gamma_p M G_n \sqrt{1 + G_p^2 / \gamma_p^2 M^2 G_n^2}$$

Since G_p is small relative to G_n , and γ_p is usually above unity, when M is large the quantity under the square root sign is very nearly unity, and the overall granularity may be taken as $\gamma_p M G_n$. The important point is that, even if the assumptions on which this conclusion is reached are only very approximately true, the granularity of the printing medium is usually very unimportant in enlarged prints.

With graininess, however, the case is different, since there is no very definite quantitative information available about graininess, except that involved in Jones' and Deisch's definition of graininess as proportional to the distance at which the sample no longer appears grainy. Consequently, if the desired simplification is to be arrived at, it will be necessary to know something about the quantitative properties of graininess. For this purpose, experiments have been made which indicate that there is a fairly definite relation between granularity and graininess, as measured by the distance of the print at which the graininess becomes inappreciable. In addition, experiments have also been made which show that visual inspection at close distances also places prints in the same order of graininess as estimation of the distance of disappearance of graininess.

These experiments were all carried out on prints, and the data so found also demonstrated the effect on the graininess of the diminished brightness at high print densities. This information enables the graininess of a print to be calculated from the granularity of the negative. But if, for the purpose of standardisation, the assumption is made that the negative is that which gives a "first excellent" print, then a fixed, or almost fixed, relation exists between the characteristic curves of the negative and positive materials. Consequently, the graininess of the print can be calculated from the granularity of the negative material and its characteristic curve.

2. Experimental Data

A large number of prints was made on bromide paper of two grades from the samples of developed negative materials, of which the granularities had already been measured (4).

These were made by direct enlargement with a microscope using a 25 mm. objective at a magnification of 80. For about half the prints the condenser was closed down to an aperture equal to that of the objective as in Figure 1A, so that the image was projected by as near specular light as can be obtained with the objective in question. These prints are referred to as being obtained by specular illumination. The other half of the prints was obtained with the condenser stopped out in the centre

up as shown in Figure 2. The field in view consisted of border surrounding a rectangle by 10 inches of diameter the intensity of illumination about 5 milli-lamberts. In the field of this screen was a 2-inch hole, through which the print, and its surround, also of intensity 0.6, could be seen. The print was also illuminated at 5 milli-lamberts incident intensity arrangement was chosen as resembling roughly the conditions of

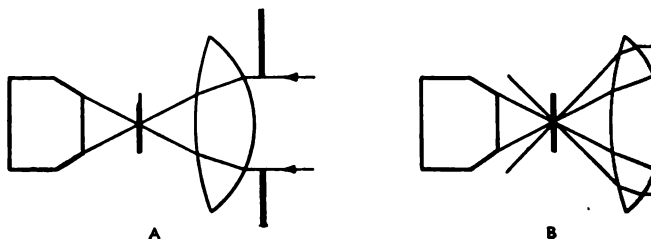


Fig. 1—Condenser stops used to obtain specular and diffuse illumination*

so that only light diffused by the specimen was thrown into the objective, as shown in Figure 1B. These prints are referred to as being obtained by diffuse illumination. The prints were all made at the same time of exposure, but the intensity of the light was varied by means of neutral Wratten filters, so that prints of different densities were obtained. A small area of the sample of negative material was covered by a piece of glass when the prints were made, so that over this area the image was out of focus, and also diffused by the spherical aberration introduced by the glass. Each print, therefore, carried a fairly uniform patch from which the mean density could be read.

The graininess of the prints was assessed by two different methods.

In the first way, the distance at which the graininess reached vanishing point, as described by Jones and Deisch, was measured for each print. For this purpose apparatus was set

up as shown in Figure 2. The field in view consisted of border surrounding a rectangle by 10 inches of diameter the intensity of illumination about 5 milli-lamberts. In the field of this screen was a 2-inch hole, through which the print, and its surround, also of intensity 0.6, could be seen. The print was also illuminated at 5 milli-lamberts incident intensity arrangement was chosen as resembling roughly the conditions of

a print. It would probably be more representative of normal conditions of viewing if the intensity of illumination had been higher. The prints were placed in a holder and moved steadily point at which the graininess became obvious to the point at which it was estimated to disappear. The prints were shuffled to get a distribution, and the measurements were made, one sitting on each print. The measurements were made, the prints thoroughly between sets, in order to eliminate any possible effect of systematic errors which might have been produced if the prints left always in the same order. The graininess of the prints was also estimated by visual inspection, the object being to arrange the prints in order of graininess. It was an almost impossible task to arrange all the prints in order of graininess, so the following way was chosen: at the same result was desired, standard prints were selected which had graininesses extending to about the maximum shown by the prints, in what were to be equal steps. These were then put down in a row. The remaining prints were then gone through, putting each print which was judged to be approximately in graininess as one of the standards down beside them. This sorted the prints roughly into six classes. Then three or twenty-four prints from each class were then carefully put out in order of graininess.

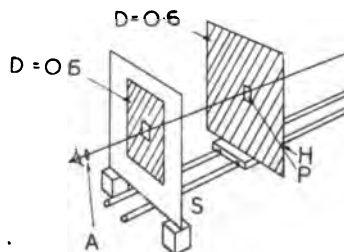


Fig. 2—Apparatus for measuring distance of disappearance of graininess

A. Aperture through which observations are made
S. Fixed Screen H. Moveable Print Holder
P. Aperture for print

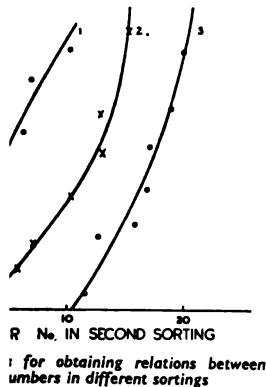
assigned a number equal to the order. The prints were sorted in order five times, and the position for each print was obtained from the five orderings. The prints of the first three orderings were thus fairly accurately sorted into groups, many prints of one group being less grainy than the prints of the neighbouring groups of which the prints were made. In other words, the ranges of graininess were overlapped. The first three orderings were tied together and a homogeneous order of sorting was obtained by the following device. The prints of each group were arranged in order of their average order of graininess, which meant that some of the prints were made equal, and the prints of these series were sorted by one print being taken from each group. This was done for twenty or so prints from each group, three groups which were sorted out into order of graininess. This had been done in the same way as before, the old order was plotted against the

tached to estimating the order of the whole 140 in one operation.

The final data, therefore, available for analysis consisted of the measurement of graininess on the negatives already reported (4), the distance of disappearance of the graininess of each print, and the order number of each print when the prints had been placed in their estimated order of graininess. The values G_0 of the graininess, have been adopted as measures of the graininess. The justification for doing so is that these values seemed appropriate for the magnification used in making the prints, and that they do fit in moderately well, as will be seen later, with the new estimates of print graininess. The new experimental data leaves a good deal to be desired on the score of precision of measurement. Some improvement could have been made by increasing the number of observations, but the precision obtained seems to be adequate for the present purpose. There is also, of course, little point in striving for great accuracy in measurements of graininess when straightforward visual inspection will not reveal close differences.

3. Relation Between Distance and Granularity

If the distance of disappearance of graininess for a print on a given grade of paper from a given sample of negative material is plotted against the density of the print, a curve somewhat like an inverted parabola is obtained, showing a maximum at a print density of about 0.6. Four examples, namely, the most and least grainy samples printed on both grades of paper are shown in Figure 4. If the distances of disappearance at which these maxima occur for one grade of paper are plotted against the measured granularity of the



negative samples, the points are found to lie moderately well on a curve. Now it is a reasonable supposition that the granularity of the prints is equal to the granularity of the negative multiplied by the slope of the characteristic curve of the paper at the density at which the print was made. Except in so far as the magnification makes the granularity and spread of light in the paper of little consequence, the effect of magnification is not considered, since it is constant in all the prints. Thus, if we plot the distance of disappearance against γG_0 where γ is the slope of the characteristic curve of the paper at the density 0.6 at which the maximum occurs, and G_0 the granularity of the negative material, we would expect the points for the soft bromide paper and for the hard to lie on the same curve. This has been tested for the prints obtained by specular illumination, and has been found to be so as shown in Figure 5. The values of γ used were obtained by taking the mean slope of the paper curve over a log. exposure range of 0.4, around the density of 0.6, rather than the slope at the density of 0.6. This seemed to

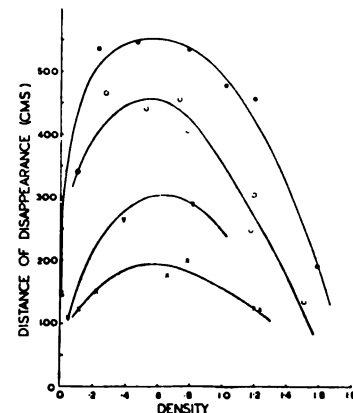


Fig. 4—Variation of distance of disappearance of graininess with density of print

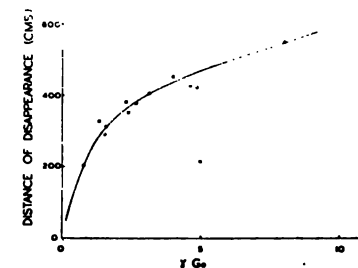


Fig. 5—Variation of distance of disappearance of graininess of prints of density 0.6 with slope of printing paper curve and granularity of negative
Circles: Hard grade Dots: Soft grade

be more appropriate than the slope itself, since the variation of density of the negative is not infinitesimally small. It will be observed that the curve relating the distance of disappearance to γG_0 is very strongly curved. This appears to be a genuine phenomenon.

A second set of experiments, made with much bigger prints, in order to avoid the criticism that the apparent diminution in size of the prints was so altering the conditions of viewing that an effect such as this was to be expected, also gave points lying very closely on the curve shown in Figure 5. The reason for this striking discrepancy with the theoretical prediction that the distance of disappearance of graininess is proportional to the granularity (7) has not

been found. It may be an instrumental or personal peculiarity of the observer. It can hardly be due to the change of size-acuity of the eye with distance discovered by Freeman (6) for his observations indicated an increase with distance which would indicate a change in the distance of disappearance opposite that found in the present observations.

For the present purpose, the establishment of the relation which actually existed in these measurements, between the distance of disappearance of graininess and granularity is all that really matters.

4. Relation of Graininess of Print to Paper Gradient and Density

The curve obtained, as described in the last section, may now be used to convert the distance of disappearance observed for each print, whatever its density, into a nominal value of $\gamma_p G_0$. If these nominal values $\gamma_p G_0$ are divided for each negative material by the appropriate value of G_0 , values will be obtained for what might be called the "effective gradient" of the paper. This has been done for all the prints obtained by specular illumination on the more contrasty paper, with the results shown in Figure 6, which will be

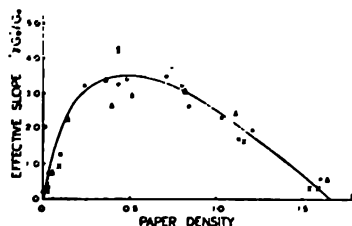


Fig. 6—"Effective Gradient" of paper

observed to have some correspondence with the shape of the gradient curve for paper. A gradient curve for the paper was calculated by taking the mean slope of the paper curve over log. exposure intervals of 0.4, and the ratio of the paper gradient to the effective gradient was then obtained. This shows a continuous rise with density, except at the lower densities, where it is approximately constant for a short interval. Similar measurements were made from the prints obtained with specular illumination on soft paper, and the ratio again calculated. The figures for this ratio for the two grades of paper are shown in Figure 7. The increase of the ratio towards the higher densities of the paper is attributed to the lower contrast acuity of the eye at the higher densities, which causes the ap-

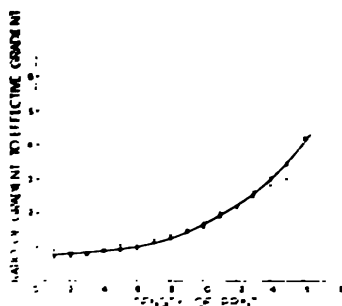


Fig. 7—Effect of density of print on apparent reproduction of granularity

parent graininess to be less than that calculated by $\gamma_p G_0$. The scale of ordinates is, of course, arbitrary; the method of calculation automatically makes the ordinate unity at a print density of 0.6.

Reasons have been given already for supposing that the apparent graininess depends on the square root of the contrast sensitivity of the eye at different densities (7). The most appropriate measurements of contrast sensitivity of the eye with which to compare the curve of Figure 7 appear to be those made by Abribat (8), and the agreement between this curve and the results given by Abribat for illuminations approximating to those used in these experiments is as good as can reasonably be expected. The influence of varying brightness on somewhat similar measurements of graininess has been investigated also by Lowry (3), who established that a diminution in brightness caused a diminution in the observed graininess. It does not seem to be possible to obtain with certainty from Lowry's results any relation similar to Figure 7, but qualitatively the agreement is satisfactory.

5. Agreement Between Visual Estimates, Distance of Disappearance and Granularity

It will be convenient and appropriate to break off at this point to discuss a question which is of some importance, although it has not yet been mentioned. This concerns whether the distance of disappearance or the granularity does, in fact, show a satisfactory correspondence with visual estimates such as have been obtained by placing the prints in order of graininess. This question can be examined, of course, by plotting the distance of disappearance for each print against its order number. When the whole 140 prints are thus plotted, the scatter in the points is very considerable, as can easily be understood. But if the points are averaged in groups as

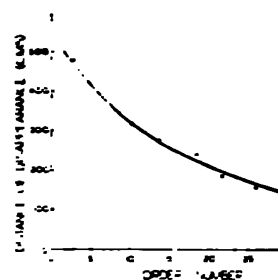


Fig. 8—Relation between a distance of disappearance of graininess and order obtained by sorting

shown in Figure 8, it will be seen there is a reasonably constant variation between the distance of disappearance and the order number. As already stated all the prints used to derive this curve, applies whether the print obtained by specular or diffraction illumination.

The order numbers appear greater quantitative significance might at first sight have been imagined. Imagine four prints, of which high graininess, one low and two equal intermediate graininess intervals between the three of graininess are substantial order numbers of the low graininess prints will inevitably 1 and 4, but each of the intermediate prints will have order number 3 assigned to them at random equal number of times, so that prints will finally come out in order 1, 2, 3, 4, and 4. There is a tendency for the prints to be out into groups at equally intervals. A strong local concentration of prints, all of the same graininess (or of approximately the same graininess), will upset the quantitative accuracy of this procedure. For instance, we might suppose instead of one print of low graininess there were 10 all of the same graininess, two of intermediate graininess, and one of high graininess. Then the final order numbers would be: the average of 1 to 10, 11, 12, and 13. But the actually used, of sorting into stages, should reduce the such local concentrations. figures 5.5, 11.5, and 13 become, in the second sorting, 11, 12, and 13, since only one print of 10, and one of the pair would be used for the sorting into order. Thus, it seems to be reasonable to take equal order number difference arrangement finally arrived at, if only very approximately equally visible differences of graininess. Obviously, this con-

upon there being sufficient make it fairly sure that the graininess between any is not much greater than detectable difference. Jones had a somewhat similar of rather more limited probably therefore more gical) in discussing the t of prints into order of ality.

evidence that the disappearance of graininess at low density is rather less be indicated by the curve by reference to the order but the difference is not be order of 10 per cent—most certainly dependent server, or even upon the pinions at different times. reference to Figure 5, the disappearance can be into an equivalent figure rity. This provides us relating visual estimates is to granularity, which

Figure 9, and it will be here is an approximately on between the logarithm

the specific object of obtaining such information as might be possible concerning the x -term already discussed in the measurement of granularity (4). No real success has been reached on this point, although the figures obtained for the ratio of graininess in diffuse and specular illumination show some suggestive similarities to the ratio x/G_0 , shown in Figure 18 of a previous paper (4). The ratio of graininess of the prints made with diffused light to that of prints made with specular light is 0.4 on the average. This is almost certainly a lower limit to the ratio possible with enlargers of different type.

7. Calculation of Print Graininess from Negative Graininess

It is now possible to calculate the graininess of a print from the granularity of the negative. In Figure 10

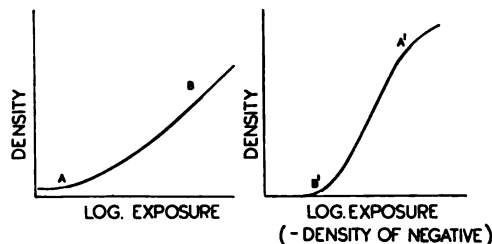


Fig. 10—Characteristic curves showing mode of transference of granularity from negative to print

the left-hand curve represents the characteristic curve of the negative material. It is supposed that the granularity of the negative material is known for all densities within the range A to B of the negative under discussion. The right-hand curve is the positive characteristic curve, and for the print under discussion the exposure through the negative density A leads to a print density A', and that through the negative density B to a print density B'. First it is necessary to multiply the granularity of the negative material at a given density by the slope of the positive curve at the point at which that density is exposed. Thus the granularity at A is multiplied by the slope at A', at B by the slope at B', and similarly at intermediate points. This gives a series of values of print granularity which may be plotted against the original subject brightness or log. exposure scale or against the density of the print. The curve must then be modified to allow for the reduced acuity of the eye at the higher print densities. The final result is then the print graininess.

This process is susceptible of considerable simplification in practice. If the prints were such that the tone reproduction was perfect, that is,

so that the product of the slopes of the two characteristic curves at corresponding points was always unity, the granularity of the print would be given by G/γ_n , where G is the granularity of the negative and γ_n the slope of the characteristic curve of the negative at the appropriate point. For the granularity of the print is $G\gamma_p$ and $\gamma_n\gamma_p$ is unity, γ_p being the slope of the characteristic curve of the printing material.

A typical curve for G/γ_n is shown in Figure 11. Now the standard negative now considered as the fundamental basis for speed measurement, is that which leads to the "first excellent" print as defined by Jones (2). The data given by Jones indicates that the tone reproduction curves of the first excellent prints from a number of negative materials are all very similar. If the "first excellent" print is adopted as the standard print for which the graininess should be estimated, therefore, the necessary allowance for the lack of perfection of tone-reproduction can be made from a standard tone-reproduction curve, approximating to those found by Jones. The slope of the tone-reproduction curve which connects the density of the print

with the logarithm of the brightness of the subject is equal to the product $\gamma_n \cdot \gamma_p$. Consequently, if the tone-

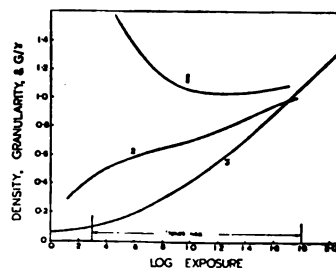
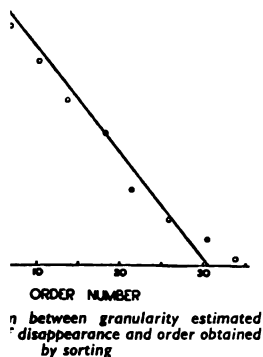


Fig. 11—Data involved in calculation of print graininess assuming perfect tone-reproduction
1. Curve of G/γ_n 2. Curve of Granularity
3. Curve of Density

reproduction curve is represented by a plot of its slope against log. exposure, as represented by the full line in Figure 12, which has been estimated from the data given by Jones, the correction to the values of G/γ_n obtained from the negative curves is obtained by multiplying G/γ_n by the ordinate of Figure 12 at the appropriate log. exposure point. In addition to this correction it is also necessary to allow for the effect of lack of acuity of the eye at the higher densities, which may be done



granularity and the order [this result may be unexpected in view of the occurrence of this logarithmic visual measurements. to the early examples for a logarithmic law was the latest is a similar law as of contrast of printing

and Specular Illumin-

not very much has been prints made with diffuse . These were made with

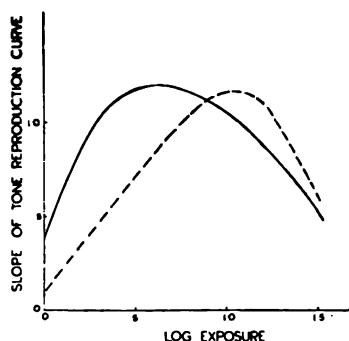


Fig. 12—Correction curves to allow for imperfect tone-reproduction and loss of visual acuity at high print densities

by using the curve of Figure 7. This has been done to give the broken-line curve of Figure 12, by assuming that the tone reproduction curve relating print density to negative log. exposure is a straight line of unit slope. Obviously, it is not, but the error introduced as a consequence is small. The ordinates of the full-line curve were divided by the ordinates of Figure 7, to give the broken-line curve, which is, therefore, such that if the values of G/γ_n are multiplied by its ordinates, they will be adjusted to print graininess values. But in actual fact, it is not necessary to go through this multiplication process to arrive at satisfactory figures for the print graininess, for it will be observed that the values of G/γ_n are fairly constant over a considerable range near the maximum of the broken-line curve of Figure 12, and this is characteristic of all the negative granularity curves examined. Thus it is known that the maximum graininess will occur at a log. exposure value 1.05 units above the lowest brightness of the subject range, and if the value of G/γ_n is taken at that point, it should be a satisfactory measure of print graininess. This calculated position of the maximum agrees quite satisfactorily with the position of the maximum observed in the curves of Figure 4, namely at a print density of 0.6. The figure of 0.6 suggests, however, that the log. exposure value should be rather less than 1.05. For the purposes of standardisation, a log. exposure value of 1.0 seems quite appropriate. The method of measurement which this argument suggests, therefore, is to determine the granularity of the negative material at various densities, and convert these, by means of the same characteristic curve as is used for the speed measurement, into values of G/γ_n . When the Jones' speed point has been found, the value of G/γ_n at a distance of 1.0 log.

exposure unit above it is taken as the print graininess. For this purpose the real slope, and not the mean slope, over a log. exposure range of 0.4, may be used.

8. Experimental Check

The value of this proposal was put to the test by measuring the granularity of a number of materials by means of the instrument described by Romer and Selwyn (10). This instrument gives G -values substantially equal to those quoted previously as G_0 -values. Then small negatives were made of a large transparency, shown in Figure 13, which was designed to be without small detail, and to reveal graininess easily, on the same materials, and the negatives were enlarged up to the original size of the transparency. The apparatus for this purpose consisted of a specially designed camera, which was also convertible to a projector, using

these no doubt that the illumination over each step was uniform.

The prints were arranged of graininess by visual inspection of 21 observers. The mean observations obtained from these observations were then plotted against the logarithms of the measured G/γ_n with the results shown in Figure 14. The occurrence of points so near a straight line regarded as somewhat fortuitous and the agreement of the two measures as rather better than legitimately be expected.

Although, therefore, the experimental data by which this of estimating print graininess arrived at are not so precise as desired, the final conclusion to be well justified.

It is suggested, therefore, that graininess of negative material described for pictorial purposes



Fig. 13—Transparency used as subject for making standard negatives and prints

a selected 2-inch "Ektar" lens. The papers on which the enlargements were made were chosen to give as nearly as possible a print of the same quality for all negatives, and the original negatives were made at such exposures as would lead to negatives approximating to the type specified by Jones as giving "first excellent" prints. It is not really necessary for the present purpose that the negatives should be exactly of this type, provided that all the prints are good prints, and as closely similar to each other as can be obtained, for the minimum in the G/γ_n curve is nearly flat. The original transparency included a wedge so that the actual characteristic curve for each negative could be obtained, and it was this curve which was used for determining the appropriate γ_n value for finding G/γ_n . The granularity was measured on time-scale sensitometric strips, developed in the same way as the small negatives. Time-scale strips were used because there was with

the granularity divided by the characteristic curve a 1 log. exposure unit above 0.3G point.

For technical purposes: specification of graininess

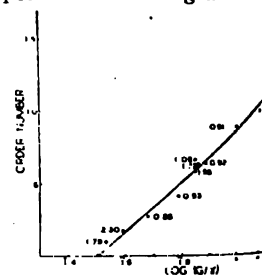


Fig. 14—Relation between order obtained and values of print graininess obtained by method

The figure opposite each point is the order of the negative

probably be given by means of granularity itself at various densities or log. exposure values

am indebted to several members of the Kodak Research Laboratory assistance in various ways, notably Mr. J. M. Gregory, for making prints discussed in Section 2, and Mr. J. A. Carter, for making the negatives and prints described in Section 8.

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THE 16 MM. FILM AND THE DYNAMICS OF LIVING MATTER

By Professor J. Yule Bogue

A Meeting arranged by the Kinematograph Section of The Royal Photographic Society was held at 16, Prince's e, S.W.7, on January 16th, 1943, with the PRESIDENT, Mr. D. McMaster, F.R.P.S., in the chair.

n introducing the speaker, The PRESIDENT said they were gathered together to hear an unusual e of address and one which promised to be intensely interesting. Professor J. Yule Bogue, fessor of Physiology of the Royal Veterinary College, and working at the Nuffield Institute Medical Research, was to give a lecture on "The 16 mm. Film and the Dynamics of Living tter." He was one of the foremost authorities in this country in this study and would give an ount of how photography in general, and the 16 mm. film in particular, could be put to use in the dy of living processes.

ROFESSOR BOGUE said:—

Firstly I will give you a general idea as to the scope of our work, where possible, illustrate it excerpts of films which have a made in the investigation of e of the properties of living ter. Biology is the science of life, is composed of a number of nces all of which are concerned h living things. To-day we will d briefly with one of these sciences, nely, physiology, and the role ich the kinematograph film in eral and the 16 mm. film in par- lar plays as a scientific instrument tuding the fields covered by this nce.

think that we may, with advan- b, get clearly in our minds what nean by physiology. Physiology e study of living things, or, more tly, living things in action. Not e sciences of life which deal with Gross structure of the body: omy, or the microscopic structure e tissues and organs of the body tology, which are often unfor- tely pursued without proper eciation of the fact that the es are no longer living, but the y of these tissues and organs and body as a whole while alive, and s nearly normal conditions as is ble. The various techniques h we employ often render the tes abnormal, but we do strive all time to approach the normal,

particularly in respect of the im- mediate environment in which the tissue or organ may be situated in the experiment. We study the nature of living processes, and are not only interested in the immediate applica- tions of this science to medicine and health, but have always in the back of our minds the attempt at finally interpreting all living phenomena in terms of a physico-chemical system.

Living things are in a continual state of change. The organism is ever adapting itself to the changes in the environment in which it lives in order that its own internal environment shall be maintained as nearly con- stant as possible. Take, for example, temperature: when the external temperature rises, it results in a series of very complicated reactions and changes taking place within the body, which result in the body losing heat more rapidly, e.g., by sweating, and also prevent it from producing too much heat, so that the cells which constitute the body shall remain at a reasonably constant temperature. The cells of the body can only func- tion within a relatively restricted environment. If the tissue fluids become only slightly acid, the organ- ism will die; or if they become faintly alkaline, say as tap-water, the organism will go into tetany. There- fore, during its whole lifetime the organism has to maintain a middle course between these narrow limits.

In other words, the internal environ- ment must be kept constant in spite of wide changes in the external en- vironment.

These processes and reactions mean that there will be a large number of physico-chemical changes taking place within the body. The animal absorbs food from its environment and, after digesting it, converts it into energy, as, for example, in the case of sugars; or stores it as latent energy, as in the case of fats; or uses it to repair and make good deficien- cies, as in the case of protein. All these processes involve the transfer- ence of energy, so that we can, there- fore, truly speak of the dynamics of living matter.

Physiology, like many other sci- ences, is dependent for its progress upon the advances made in other sciences, particularly chemistry and physics, and photography is part of these sciences. This does not mean that the physiologist always has to wait for the physicist or chemist to produce a new technique; many physical and chemical techniques have been produced by the physiolo- gist, but, by and large, any advances which are made in physiology are more or less dependent upon advances which have been made in the other sciences. I do not think that it is generally realised, how significant a part the sub-standard film can play in the study of living matter. This

The whole story was at last revealed. The changes which take place at birth, by means of X-ray cinematography. An X-ray opaque contrast medium was injected into the blood stream, and its course followed by means of direct and indirect X-ray cinematography. In the former method, first developed by Alvarez and Little, up to six frames per second were taken on 3-inch film which ran between a pair of intensity-

while in the latter, a 16 mm. film, fitted with a F/0.85 lens, driven at 25 frames per second, photographed the image on a special Liossal fluorescent screen. It was then evident that the flow of blood entering the embryo took different courses: it had to cross in space, the circulation of the blood had been worked out by methods.

X-ray cinematography has been successfully used to show the mechanism of swallowing movements of the stomach and the movements of the oviduct. In 19 cases, this work has had the advantage of being done on the living animal, so that it is as accurate as it is possible to get. Work along these lines, in my opinion, has been done by Harcroft, Franklin and I, who used an improved indirect technique of X-ray cinematography.

The Physiological Laboratory of the Leningrad Clinic, has a 16 mm. film, divided up into 400-foot reels, on the subject of the phenomena of irritability in muscles, then passes through the action to the complex reflexes in animals and the film would be invaluable for use when lecturing on the system to their students. The most spectacular use of the film has been put, in the field, is in the study of the early stages of development and early developing mammalian ovum by means of cinematography and a time lapse film. It is possible to observe the sperm into the ovum cell division which then changes into a cell film, in addition to the early stages of development points which would have been observed without the film. For example, the vigorous movement of the cytoplasm (cell substance) division, the changes in the cells, and the conformation of the ovum after the formation of the cavity. An example, demonstrating these as they have been produced by Lewis and P. W. Gregory,

the technique has been used with success in investigating the changes, cultivated in tissue inside the body. Canti and I made a film showing the development of a completely isolated unmyotome leg-bone tissue, formed leg. When this tissue was isolated from

a chick embryo, it was a small shapeless mass.

The film has also been used in the study of abnormal growth and is being, at the present time, directed towards the understanding of cancer cells. A film on this subject has been produced quite recently.

The recording of the most characteristic phenomena of normal life processes, namely, complex cell division, will surely assist us in completing our picture of the mechanical development of living things. This is one of the most fundamental and dynamic aspects of our work.

Another American worker, D. C. Warren, has made an excellent film on the forming of an egg. He has shown, in Kodachrome, the changes undergone by the hen's egg in its journey from the ovary to laying in the oviduct.

This brief survey should show that the film can play a useful part in studying living processes, from the fertilization of the living ovum to its death as a multicellular organism. The film, therefore, is an essential scientific instrument in the study of the dynamics of living matter.

Professor Bogue then showed some films to illustrate his talk. The first was made up of a number of extracts from various scientific films which he or his colleagues had produced. The first "scene" was an X-ray picture of a human being swallowing, which was also projected in reverse to show how the mechanism of swallowing could be demonstrated. The second was another X-ray picture, this time of a hen swallowing, which caused some amusement. Third was the movement of a cat's stomach, then part of a film actually in the course of production, showing the movement of the weight-bearing knee; then the movement of the shoulder-joint. The last two were of the heart, one showing fibrillation in the dying heart, and a view of the pulmonary valves in action.

The second, and longer film, by Sanders, Ebert and Florey, was a record of a complete piece of research work carried out on capillary circulation. The work was photographed through a perspex chamber inserted into the ear of a rabbit. The audience was completely enthralled.

Discussion

The PRESIDENT asked if for teaching purposes it would be possible to have a running commentary made on a turntable with a loud speaker and synchronized with the silent picture, and Professor Bogue said that this had been done in the film from which the shot of the fibrillating heart was taken. Since physiology

was not an exact science, different teachers had different ideas as to the correct interpretation of some of the results. Some of the films sent out from the Physiological Film Library were accompanied by a written commentary, which the teacher could use or not as he thought fit. In this way he got out of the difficulty of pleasing some and displeasing others. He thought that sound synchronisation could be used with advantage in some cases.

Mr. SCHOFIELD asked how the subject was illuminated, especially the capillaries.

Professor BOGUE replied that this was relatively simple. A low voltage close filament microscope lamp, or a point-o-lite lamp, is all that is necessary. The light is passed through the optical equipment of the microscope in the usual way. Exposure was by trial and error.

The PRESIDENT asked if infra-red film had been used to get better penetration, and Professor Bogue replied that he had not used it, though some workers had. He had seen still photographs of biological material made with infra-red sensitive film which were very good.

Asked if there was any difficulty in overcoming vibration when using the high power in kinemicrography, he said that R. McV. Weston had overcome that difficulty by mounting his camera on a small lathe bed. Sometimes part of the equipment was floated on mercury, but this is not possible in wartime.

In reply to a question as to how the lymphocytes (the scavengers of the blood stream) were themselves cleaned up, Professor BOGUE said that the lymphocytes can wander in and out of the circulation and probably pass, by the lymphatics, to the lymph glands. The red blood corpuscles do not exhibit movement, and are only transported in the plasma of the blood.

Another question was whether a permanent library was being made of these films, so that teaching institutions could avail themselves of loan facilities. He said that the Physiological Society had appointed him secretary of the Physiological Film Library, the committee of which acted as a viewing and selection board. They did not commission people to make the films. The committee might suggest cuttings or additions to a film or alterations in the captions before it was accepted. Films could be hired from the library by those possessing a Home Office Certificate "C".

The PRESIDENT proposed a very hearty vote of thanks for a fascinating talk, which was accorded by acclamation.

MY METHODS WITH WASH-OFF RELIEF

By R. H. E. Beckett, A.R.P.S.

At a meeting of the Colour Group of The Royal Photographic Society, on November 14th, 1942, with Mr. F. J. Tritton, B.Sc., F.I.C., F.R.P.S., in the chair, a talk was given by Mr. R. H. E. Beckett, A.R.P.S., of Manchester, on "My Methods with Wash-off Relief."

In the course of his paper, Mr. Beckett illustrated his remarks by reference to various pieces of apparatus and material, and at the close he exhibited twelve or fourteen examples of his finished work.

MR. BECKETT said that his talk would deal only with the practical side of the process. Further, for the purpose of these notes, all working instructions, formula, etc., which are to be found in the Kodak brochure, "Colour Printing with Wash-off Relief Film," have been omitted. The methods used by the speaker are such as could be employed by any amateur possessing a reasonable amount of photographic technique, and he emphasised that special and expensive apparatus had not been used. Following a brief description of the process, the speaker then went on to discuss cameras. Practically all his work had been done from negatives made by the "direct" method, as distinct from an intermediate colour transparency; several types of camera have been used successfully, including miniature, reflex (single and twin lens), and using both plates and roll-film. His preference was a plate camera, which must have a rigid lens panel, plate-holders that are easy to fit and remove, and, of course, a fully colour-corrected lens. A speeded shutter of the "Compur" type is not essential. With regard to a tripod, he recommended the substantial wooden type, as even the best metal telescopic ones were not rigid enough to prevent movement of the camera during the changing of the slides. A "one-shot" camera had not been used.

In regard to sensitive material, Mr. Beckett stated that undoubtedly "Trichrome" plates were the best, but these, unfortunately, had been withdrawn from the market for the duration of the war. FP2 and HP2 (now FP3 and HP3) are suitable substitutes, and in roll-film, FP2 was strongly recommended. In the Kodak range, P800 plates and Panatomic-X roll-film would doubtless be quite satisfactory, but had not been used. Two types of filters had been used—the standard tri-colour set for use with daylight, and a set specially compensated to give equal exposures when using "Trichrome" plates and "half-watt" (gas-filled) lamps. In each case these filters were laid side by side and cemented between oblong pieces of "A" glass and used in a specially made holder fitting on the front cell of the lens. The filter factors used are those issued by the manufacturers for the sensitive material in use, both for daylight and artificial lighting. In calculating exposures a "Sixtus" meter is used for both types of lighting.

In practically every case a flat lighting had been used, obtained by setting up the subject well back in the room, and opposite a large window, avoiding direct sunlight. For artificial lighting, two 100-watt "Pearl" lamps in reflectors, with tissue-paper diffusers, are used, and arranged on either side of the subject—one a little nearer than the other.

A grey scale or wedge is always included where practical, and if those issued by Kodak are used, the colour patches supplied might be mounted side by side with the grey scales so as to form a long narrow whole. The blue,

red and yellow patches might also be marked with bold "R," "G," and "B," respectively, using wash-off relief film. This provides a certain and automatic method of identifying the negatives after development, by denoting which filter was used. As a matter of fact, the patches are already marked in white to denote the process used, but this marking he found too small. The Kodak plates are printed on a semi-matt paper and are rather prone to reflections, which can be avoided by very slight tilting of the scales. For outside work, the scales are far too large to be of any use, and while a "wedge" can be used for such use from bromide paper, having three grades of white, neutral grey, and black, these generally are so large as to be very cumbersome in transport. In the class of work, "Trichrome" plates have been used successfully, without the help of any grey scales, giving equal exposures for the negatives, and equal exposures on relief film, trusting to the corrections the process makes after dyeing to correct any out of balance, so as to produce a pleasing and satisfying result.

The development of the negatives calls for no special treatment, grain, unless very excessive, being no account. Normal contrast is required—such as is obtained by printing satisfactorily on a normal or medium bromide paper. For "Trichrome" FP2 and HP2 plates, Ilf developer is used, allowing five minutes at 65°F. For FP3 and HP3 plates, not been found necessary to develop the blue-filter negative for a longer period than the other two. For "Trichrome" plates are concerned, and the speaker stated he had found this to be almost the case with HP2 plates, and FP2 roll-film. Any slight contrast in this negative can easily be corrected by using a slightly more acid to the yellow dye. (Developing times with the new FP3 and HP3 plates will differ from those quoted above).

Mr. Beckett then went on to describe his method of obtaining the correct exposure for the relief film. The main success depends largely on the correct exposure (assuming a satisfactory set of negative factors). Preliminary tests are made on bromide paper. Mr. Beckett found Kodak "Nikko" medium to be satisfactory, developing for two and a half minutes in DK50 developer, and afterwards fixing in an alkaline bath. The red-filter negative is always used for test, and in judging the exposure it has always been helpful to judge the depth of the image in terms of colour. For instance, in a red flower, a tomato or a red apple, there is very little blue, so that the image will be light in colour—in fact, only sufficient to give a pinkish tone. If the green filter negative is used, we shall have a deep blue in terms of red, which is not so easy, and the red filter is not used to the same extent as the blue for red purposes. In making the test, select a portion of the image which might be termed "typical." It should include large areas of shadow or high lights, but

something, if possible, containing a lot and a little inclusion of the grey scale is not necessary. Ex- are now made until a print is obtained which is a ghter than normal—taking into account the of blue in the original. If the colour of the objects i in the tests is neither distinctly red or blue, the depth must be judged according to whether the s were heavy in colour or otherwise.

Beckett stated that experience entered largely into sion of correctly judging the exposure, and examples of such tests to illustrate his points. decided on an exposure, three tests are now made ce of relief film, one of slightly less exposure than it, one the same, and one slightly more. For , if 25 seconds was considered correct, the ex- on the relief test might be 20, 25 and 30 seconds. st is then developed in DK50 developer for nutes at 70°F., washed in several changes of and then examined unfixed, and, while wet, 1 the bottom of a white dish or on a sheet l glass, and in the light of the safe-lamp. age will be observed to be distinctly "softer" rast than the bromide print, which adds to iculty of judging correct exposure. The correct es should be just sufficient to produce a very eiling over the highest lights without burying the s. The object of these three tests is to see if our from the bromide print is correct, or if a little ore exposure is advisable. The final test can only le after dyeing and superimposing the reliefs, o correction beyond repeating can be made. The strongly advised, if in doubt, to err on the generous e process permits, after dyeing, of the correction er-exposed relief (unless the excess is very large), e is no remedy for an under-exposed relief.

g decided on the exposure for the red-negative rinter), the next step is to decide the relative e for the other two, and for this the grey scale is ssume that 25 seconds is decided as correct for the nter. A test of the grey scale from each of the gatives is made on BG2 bromide paper, each one g 25 seconds exposure, and marking on the back icular negative from which the test was made. o of comparison Mr. Beckett recommended that ide paper be cut to the same size as the projected f the grey scale. These tests are developed for 2½ in DK50 at 65°F. and then fixed. They are then one above the other on a sheet of glass, making at the respective gradations coincide, and then d in white light, being careful to distinguish : density and contrast. It may be found that all e equal at the lighter end of the scale, but that the rinter is not so dense at the darker end. This is slight lack of contrast in the blue-filter negative, be corrected by adding more acid to the yellow on future occasions, by developing that negative htly longer period. If the three tests do not show , further tests must be made for the red and rinters, until a reasonably accurate match with : printer is obtained, which will then give the exposure for all three relief films, and typical test ere again shown to illustrate the points men-

: proceeding with the exposure of the relief films, :utions should be taken. The first is designed to excessive trimming of the finished print due to of the three images. The red-filter negative being 1 the enlarger, a sheet of white paper is placed in ting frame or other device which will permit the of the paper and replacement by the film in the same position. The image, being projected on white paper, is sketched in with a pencil. Now

remove the paper and replace by the film without disturbing the position of the frame and expose. The green-filter negative is now inserted in the enlarger and the paper in the printing frame, the latter being adjusted until the image coincides with the pencilled image. Again change paper for film, expose, and repeat with the blue-filter negative. When the three images are finally superimposed, very little overlap and consequential wasteful trimming will result. The second precaution is to provide a means of identifying the three films. He always exposed in the same order—red, green and blue filter negatives, punching in the edge of the film one, two and three small holes, respectively, representing the blue, red and yellow printers. An alternative method is to cut one, two and three corners of the film.

Mr. Beckett then dealt with the processing of the films. DK50 developer is used, made up to double strength, and it is found that 500 cc. of this, diluted to make one litre at working strength, is sufficient to process three 10-in. by 8-in. relief films, including the preliminary tests. The films are developed for five minutes at 70°F., or 6½ minutes at 65°F. Although Mr. Beckett described in detail his method of processing the films, for the sake of brevity the reader is referred to the Kodak brochure previously mentioned. The three films are developed simultaneously in three dishes, pouring on the developer at half-minute intervals. At the expiration of the five minutes, the developer in the first dish is poured off and the film given one or two rapid washes in plain water and left immersed in water. At half-minute intervals the other two are similarly treated. Proper washing is now carried out by ten complete changes of water for each dish, each change being of one minute's duration. By these means developing and washing can be carried out without touching the films; they are extremely delicate when wet. Bleaching, hot-water development, fixing, clearing, etc., do not call for any special comment. An acid hardener fixer is used both after hot water development and clearing, and washing after the use of this fixer is carried out by five complete changes of water, each of one minute's duration. The reliefs are now hung up to dry before dyeing.

The reliefs are dyed for 30-40 minutes, as described in the Kodak brochure, but there seems to be some doubt as to the necessity of adding acetic acid to the dyes. Some workers seem to think this only necessary when the negatives are lacking in contrast. Mr. Beckett stated that he always commences by adding 2 to 3 cc. 5 per cent glacial acetic acid to each 100 cc. of red and blue dye, and 3 to 4 cc. of acid to the yellow dye. In the matter of the ½ per cent acetic acid rinsing after dyeing, although the official instructions specify distilled water, he had always used tap water. He qualified this by saying that his water supply is very soft (i.e., little or no lime content), but where water was "hard" this would probably not be satisfactory for the purpose.

After dyeing the films are placed in register on a sheet of white opal glass in the order of red, blue and yellow, and it is found very helpful in registering the yellow image if a "daylight" blue lamp is used. The result is first examined for depth, and then balance. If any colour appears too strong, it can be reduced by careful washing in plain water at about 75°F. If the result appears too heavy—due to over-exposure of the reliefs—they may be reduced by careful washing of all three reliefs in plain water as before. After washing, the reliefs should be returned for a few moments to the ½ per cent solution of glacial acetic acid to "fix" the dyes. In washing, care must be exercised in regard to the yellow dye, as this washes out very quickly. If the result lacks contrast or is weak, or if any colour appears too weak, this can be corrected by re-dyeing in a dye or dyes containing a

PRODUCING AN EXHIBITION PRINT

By Donald Allen, F.R.P.S.

At the joint meeting of The Royal Photographic Society and the Preston Scientific Society, Photographic and Cine Section, held at Preston on October 6th, 1942, with the Chairman of the Preston Society, Mr. E. S. Maynard, presiding, Mr. Donald Allen, F.R.P.S., F.R.S.A., gave an interesting lecture on "Producing an Exhibition Print."

PRODUCING an exhibition picture is quite a different problem from producing an exhibition print. The production of the picture starts even before the negative has been exposed, whereas the production of the print starts in the darkroom, and may, with a good negative, be purely mechanical.

There are two lines of approach to the exhibition picture—

- (a) Control in the darkroom, i.e., production of the print.
- (b) Selection of the subject material, i.e., production of the picture.

The production of the picture starts right from the beginning before the negative is exposed, and involves seeing in any particular subject some pictorial quality. On the other hand, the production of the print occurs in the darkroom from any negative which may be considered to show pictorial possibilities.

The production of the picture can be separated into three stages:—

1. Approach.
2. Treatment.
3. Technique.

Approach

The true approach to a picture is that which utilises an idea in the mind. In this way the picture has already been thought out, composition decided upon, the title is ready usually in this approach a title suggests the picture), and it remains to put the idea into operation. It may be that you can do this immediately, that suitable subjects or scenes come to mind with the idea of the picture. On the other hand, you may have to preserve the idea until such times as the ideal location or subject is found.

This is the true approach to the picture, and the one that provides the greatest satisfaction, but it is one rarely used by photographers. What usually happens is that the camera is taken for an outing, the photographer making one or more exposures

on any subject whose pictorial merit happens to catch his eye.

This method of going out looking for pictures requires an ability to perceive pictures even in the most unlikely subjects. This ability to perceive can only be obtained by constant application, such as the careful analysis of the work of photographers of repute. The failure of the young pictorialist to find pictures among his everyday surroundings often causes despair when he compares his own results with those of more mature workers. The ability to perceive pictures is thus gradually developed, and the photographer is better able to see beauty in line, tone, colour or design. At this stage progress is made by leaps and bounds.

To be really successful the picture must convey to the observer the same emotion as was excited in the photographer when he made the exposure.

Subject matter can be approached from two different aspects—objective and subjective.

The objective approach would include photographs of "bits and pieces," i.e., taking part of a given subject rather than the whole of it. The striking effect of a design, or a new angle, or some similar treatment which concentrates on design and form is usually the aim of the object-photographer.

The subjective approach is the more common, although it is more difficult to obtain satisfactory results. By this method it is necessary to convey a mood or impression to others who may see the finished picture. Such impressions are usually conveyed by broad effects, e.g., a landscape.

Few workers can produce both objective and subjective pictures.

The choice of subject matter will depend on personal preference, and environment, the latter being the main circumstance which guides our preference. For example, ease of access to the Lake District may lead to a preference for mountain scenes,

whereas if the worker is confined to a town or garden he will find his subjects among the bricks and flowers. Portrait work does not depend so much on locality, since so long as there are people there can be portraits, although the town worker may have more scope in that he will have a greater variety of types of people from which to choose.

Treatment

The key of the print must suit the mood of the picture. This is a question which involves choice of medium (carbon, bromoil, bromide, etc.). Among other questions which must be considered are chiaroscuro (light and shade, composition (the balance of line, tone and masses of light and shade) and pattern. Pattern is rather different from composition and can best be described as the impression made on the mind when the picture is viewed at such a distance that the details cannot be seen.

Technique

The question of technique must be considered briefly, although it does not strictly enter into a talk on producing an exhibition picture. Technique is the darkroom end of the process of producing an exhibition print, and requires careful consideration of the various qualities of the chosen medium in which the print is to be made. Another question is what amount of control is permissible? This can be answered generally by saying—As much as possible so long as you are not found out, and also, provided that you always tell what could be the truth.

Finally, I must mention a third way in which pictures are sometimes obtained. It may form one of the two ways mentioned previously, but usually incorporates something of both. This results when, from a series of unexpected circumstances, such as, for example, the weather, a picture is suddenly thrust at one, almost as a gift from the gods. The opportunity may only be present for a few moments, and has to be snatched by a quick exposure. It may be the answer to an idea which has been held in the mind for a long time, or it may be something which is perceived on the instant. In either event, speed of perception and speed of operation are necessary to record the picture at this opportunity which may never again present itself.

Vote of Thanks

An interesting discussion followed the lecture, after which, on the proposition of the chairman, a hearty vote of thanks to the lecturer was accorded by acclamation.

R.P.S. PROCEEDINGS COUNCIL MEETING

A MEETING of the Council of The Royal Photographic Society was held at 16, Prince's Gate, S.W. 7 on May 10th, 1913, when the following were present: The President, Mr. D. McMaster, in the chair; Messrs. G. Scott Bushie, L. V. Chilton, J. H. Coote, Percy W. Harris, G. E. W. Herbert, J. D. Johnston, R. H. Lawton, H. Bedford Lemere; Mrs. Rosalind Mangot; Messrs. F. J. Mortimer, Arthur S. Newman, J. H. Pledge, Ronald Procter, S. Schofield, Thomas H. B. Scott, W. Symon, F. J. Tritton, Hugo van Wadenoyen, and G. C. Weston.

New Members

The following Candidates were nominated for Membership:—

Edgar Atkinson, 3040, West 34th Avenue, Vancouver, B.C., Canada. (Member, Vancouver P.S.).

Ernest Robinson Ball, "Lydgate," 182, Chellaston Road, Shelton Lock, Derby. (Member, Derby Photographic Society).

Ray MacQuarie Beggs, P.O. Box 682, Durban, Natal, South Africa. (Member, Durban Camera Club).

Arthur F. Boucher, 29, Norton Grove, Swindon, Wilts.

John S. Candlarie (Colonel), P.O. Box 558, Santa Fe, New Mexico, U.S.A.

William Clamp, B.Sc., A.I.C., "Ivy Dean," Grantchester, Cambridge.

Harold Connold, 15, High Street, East Grinstead.

Frank A. Copper, 3, Overdale Road, Northenden, Manchester. (Member, Stockport Photographic Society).

Frederick John Croker, 21, King Square, Bridgwater, Somerset.

Reginald Arthur Cooper Ecott, 26, Downs Avenue, Rayners Lane, Pinner.

Edgar Hopkinson, 20, Lessingham Avenue, Wigan. (Member, Wigan Photographic Society).

Thomas Hollingsworth, A.I.B.P., 18, North Bar Within, Beverley, E. Yorks.

Frederick H. Hurd, 851, Lancaster Avenue, Bryn Mawr, Pennsylvania, U.S.A.

Joseph Matthew Kenny, 33, Lyon Meade, Stanmore, Middlesex.

Alfred Lightowler, 18, Chestnut Drive, Sale, Cheshire. (Member, Manchester Amateur Photographic Society).

Gilbert Lightowler, 3, The Cove, Greysands Road, Hale, Cheshire. (Member, Manchester Amateur Photographic Society).

David Moran, 14, Preston New Road, Southport. (Member, Southport P.S.).

Douglas R. Morris, 10, South View Terrace, South Shields. (Member, South Shields Photographic Society).

Frank James Morrison, Jr., Hq. 301 Bomb Group, A.P.O. 520, U.S. Army.

Johannes Ignatius van Niekerk, 32, 2nd Avenue, Highlands North, Johannesburg.

Edwin Malcolm Payne, 127, Long Lane, Hillingdon, Middlesex. (Member, E.M.I. Camera Club).

Leonti Planskoy (Dr.), c/o E. J. Evans Baker, Messrs. Kenneth Brown, Baker, Baker, Essex House, Essex Street, Strand, London, W.C.2.

Harrop Ashley Pringle, 76, Moor Drive, Crosby, Liverpool, 23.

Thomas Raymond, 93, The Avenue, Highams Park, E.4.

F/O I. W. Richards, B.Sc. (Eng.), Squadron Engineer, Officers' Mess, 41, Air School, East London, South Africa.

Samuel Robinson, The Castle School, Stanhope, Bishop Auckland, Co. Durham.

Kurt Schallenberg, Strand Arcade, George Street, Sydney, Australia.

John Spencer Sheppard, 22, Stafford Court, Kensington, W.8. (Member, Kodak Works Photographic Society).

Frank Strehill Smith, 81, Argyll Avenue, Luton, Beds. (Member, Luton and District Camera Club).

Victor Thompson, 54, Blake Street, Barrow-in-Furness, Lancs. (Member, Barrow Field Naturalists' Club P.S.).

William F. J. Tindall, 42, Parkland Drive, Stonegate Road, Leeds, 6. (Member, Leeds Camera Club).

Lyle Graeme Trorey (Capt.), R.C.E. Surveys, H.Q. First Canadian Army, England.

John Whitelaw (L.A.C. 402727), Photo Section R.A.F., Aldergrove Home Forces. (Member, Y.M.C.A. Belfast Camera Club).

Frederick Wood, Ivy House, Common Edge Road, Blackpool. (Member, Blackpool and Fylde Photographic Society).

P. S. Wijewardene, 99, Bray Brook Place, Colombo.

JUNIOR MEMBERSHIP

Michael Nicholas Allen, House, The Crescent, Morecambe, and District Photographic Society).

Jimmy Simon Feuchtbauer, Ravenscroft Avenue, N. Jamie Green, 31, Esslemon Edinburgh, 9.

P. N. Rao, Alakay, Manga Alexander Campbell Ricketts, 2, Cubley Road, ton Park, Salford, 7.

George Stewart Robert Mayfair Avenue, W. Lancs.

Kenneth Simmons, 60, borough Park, London.

The Candidates who were nominated at the Meeting of the held on April 12th (see p. 14 issue, this *Journal*), were elected Membership.

Obituary

The Council regretted the loss by death of Mr. J. B. F Senior (Fellow), of London, Mr. W. R. Webb (Member), of.

Admission to Affiliation

The following Society, upon recommendation of the Executive Committee of the Central Association of Photographic Societies, admitted to affiliation:—

M.A.P.S. Postal Club (See Mr. Gilbert Lightowler, 3, 11 Greysands Road, Hale, Cheshire).

James Shaw Bequest

It was reported that a value £102 1s. 8d., representing bequest of the late Mr. James Shaw (Honorary Fellow) to the Society had been received.

Reinstatement in the Association

Mr. J. A. R. Jordan was reinstated in the Associateship upon recommendation of the Society.

Admissions to the Association

The Council considered 11 applications from Members for admission to the Associateship. The following were admitted. [The letters of the section or sections in which the Candidate was admitted:—

Section A.1.—Practical photography. Not less than three examples should be submitted of the sub-sections.

Sub-Section A—Pictorial photography, including Portrait, Commercial, Advertising, Photo Record Photography; C—Photography; D—Natural Photography (Animal, Botanical, Entomological, etc.); F—Scientific Photography, including Micrography, Aerial Survey, Astronomical, Meteorological, Medical work, etc.; J—Photo-Engraving.

n A.2—Scientific Research
ographic subjects.

n A.3—Work on Photo-
of a definitely educational
r.

n A.4—Kinematography] :—
Stewart Alsop (London),
.A.

nder H. Aronson (New Jer-
), A.1.A.

Frederick Thomas Bailey
ndon), A.1.A.

ice Thomas Baker (Okla-
a), A.1.A.

Douglas Underwood Barry
ndon), A.1.A.

an Charles Bear (Carshalton),
.A.

Alida Maria Bishop (Mrs.)
ndon), A.1.A.

is Charles Bradley (Silloth),
.A.

nd Furness Brown (Cheadle
me), A.1, A.3.

Chapman (Manchester),
.A.

ret Crossley (Mrs.) (Oxford),
.F.

John Victor Cunningham
haranpur, India), A.1.A.

Gordon Dewhirst (Bradford),
.F.

Home Dickson (Farn-
ough), A.1.F, A.2.

s Duncan (London), A.2.

rt Ayre Edgerton (Warwick),
.A.

as Edwards (Helensburgh),
.B.

ald Frank Fletcher (London),
.A.

s Fry (Petersfield), A.1.A.

r Gilbert (Hemel Hemp-
d), A.2.

orge Gilchrist (Rhu), A.1.A, B

t Elliston Glasgow (Barn-
le), A.1.A.

R. Greenleaf (Binghampton),
.A.

e Edwin Hadley (Notting-
h), A.1.A.

nder Hunter Hamilton
therwell), A.1.A.

Alfred Harvey (Brentwood),
.A.

Henning (London), A.1.C.

Leonard Houghton (Har-
), A.2.

th Alfred Jackman (London)
.A.

rd Percival Jeffree (Wheat-
upstead), A.1.H.

Kessler (Birmingham),
.A.

s Paul Magowan (Clacton-
sea), A.1.A.

William Martin (Leicester),
.B.

Kemp McLaren (Perth),
.B.

r Michels (Rickmansworth),
.B.

Lawrence de Vere Moulds (Har-
row), A.2.

Cecil Kenneth Neale (Harrow),
A.1.A.

John Queenborough (London),
A.1.B.

David Randall Rosenthal (Edg-
ware), A.1.F.

Leonard K. Rosinger (Atlanta),
A.1.A.

Dolce Lucille Rowan (Mrs.)
(Ventnor), A.1.A.

Louis Schuck (New York City),
A.1.A.

Rolf S. A. Schultze (Harrow), A.3.

Francis J. Schulz (London, A.1.J.

Ernst Schwitters (London), A.1.A.

Leslie Wilmer Sharp (London),
A.1.A.

Richard L. Shaw (Pickering), A.1.A.

George Frederick Shepherd (Lin-
coln), A.1.A.

Constance Edna Shield (Miss)
(London), A.1.A.

Anthony Leir Shuffrey (Hemel
Hempstead), A.2, A.1.D.

Samuel Simons (London), A.1.B.

John Taylor Snyder (New York
City), A.1.A.

Rupert Holmes Swaffield (London)
A.1.A.

John Lawrence Tearle (London),
A.2.

Harry Thackwray (Bradford),
A.1.A.

G. Thomas (Bantva, India), A.1.A.

Leon Thompson (Birmingham),
A.1.A.

Edward Vear (London), A.1.B.

Lawrence Farbon Wass (Canada),
A.2.

John Ward (Liverpool), A.1.A.

Frederick Watson (London),
A.1.A, B.

Albert Victor Weatherhead (Lon-
don), A.1.F.

Frederic Weston (Sevenoaks),
A.1.A.

Oliver William Wilmot (Peters-
field), A.1.A.

Reginald Wilsher (Chesterfield),
A.1.A.

Alfred William Watkins (Gerrards
Cross), A.4.

Edward Woods (London), A.1.B.

Ernest Young, Jr. (Chorlton-cum-
Hardy), A.1.F.

John Walter Young (London), A.3.

Walter Tennyson - d'Eyncourt
(London), A.4.

Dorothy DeLain Wagner (Illinois),
A.1.A.

Admissions to the Fellowship

The Council further considered 57 applications from Associates for admission to the Fellowship. The following were admitted. [The letters indicate the section or sections in which the Candidate was admitted.

Section FA—Pictorial Photo-
graphy, including Portraiture.

Section FB—Commercial, Adver-
tising, Press and Record Photo-
graphy.

Section FC—Colour Photography.

Section FD—Natural History
Photography (Animal, Botanical,
Entomological, etc.).

Section FE—Kinematography.

Section FF—Scientific Photo-
graphy, including Photomicrography,
Aerial Survey, Astronomical, Meteor-
ological, Medical, X-ray Work, etc.

Section FG—Scientific Research on
Photographic subjects.

Section FH—Work on Photo-
graphy of a definitely educational
character.

Section FJ—Photo-Engraving] :—
Axel Bahnsen (Ohio), FA.

Colin Henry Beale (London), FG.

Wolfgang Friedrich Berg (London),
FG.

Gervase Scott Bushe (London),
FA, FB.

Eric G. Castle (Exmouth), FA.

Robinson Golding Fennah (Sal-
ford), FA, FD.

Cecil Stratton Gerrish (London) FA.

Jacobus Arnoldus C. Graaff (Cape
Town), FF.

Wallace Harvey (Coventry), FF.

Philip Sweatman Hedgeland
(Maidstone), FA.

John Wilfrid Hinde (Somerset), FC.

Thomas William Howard (London)
FE.

Philip E. Johnson (Peterborough),
FC.

Reginald Herbert Mason (London),
FB.

Carl Wallace Miller (Providence),
FG.

Albert James Milne (Farnborough),
FH.

James Nelson (Birmingham), FB.

Anthony Frederick Peacock (Lei-
cester), FA.

Harold Pearce (Ottawa), FF, FG.

Cyril Charles Redman (Ruabon),
FF.

Philip Thomas Sampson (London),
FG, FH.

Edward William Herbert Selwyn
(London), FF, FG.

Briscoe George Alsop Snelson
(Cambridge), FA.

Charles Franklin Snow (Colorado),
FA.

Geoffrey Brian Stanford (London),
FF, FG.

Arthur William Walburn (Tops-
ham), FA.

George Leslie Wakefield (Black-
pool), FG, FH.

George Wain (Hyde), FE.

The Society's House
It was resolved that during the
summer months the Society's House
at 16, Prince's Gate, S.W.7, should be
open to Members from 10 a.m. to 8
p.m., Monday to Friday, and from
10 a.m. to 6 p.m. on Saturday.

ITEMS OF INTEREST FROM VARIOUS QUARTERS

A NOTE ON AIRCRAFT CAMERAS

In the report on the Third Lecture on "Photography's Part in the War," by Mr. F. J. Mortimer, appearing in the special issue of *The Photographic Journal*, published in April, several references were made to the aircraft cameras manufactured by the Williamson Manufacturing Company.

As seen from the accompanying illustration, taken from a recently issued brochure, "Williamson's Silver Anniversary," this firm have concentrated on the design and manufacture

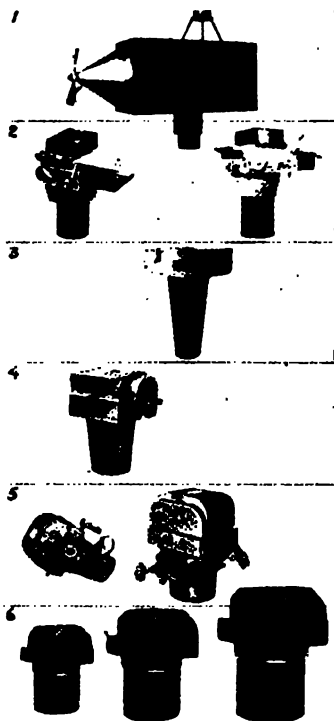
purpose camera now in use by the R.A.F., and very large quantities have been manufactured.

The complete range of Service cameras are all made on the unit principle, which not only greatly assists in quantity manufacture and maintenance, but alterations can be made to individual units to suit varying conditions without the necessity for a radical alteration to design. For example, a great variety of lens units for wide angle photography, night flying, and also high altitude work, are interchangeable on the same camera. Shutters with a large range of speeds and magazines with varying capacities, can also be used.

So far as controls are concerned, these are also interchangeable without alteration through the whole range of cameras now in use, greatly simplifying production and maintenance.

As already mentioned, a summary of the development of the reconnaissance camera is shown in the first illustration on this page.

- (1) 1916. The "Aerocam" (Type F.1) The first automatic air camera. Perforated roll film and instrument records.
- (2) 1917. L. Camera (Type P.6)—L.B. Camera (Type P.7)—The first automatic plate camera. Power operated from air screw.
- (3) 1918. L.C. Camera (Type F.2) —Large picture and automatic operation from air screw.
- (4) 1919. Eagle I (Type F.8)—Large picture, electrically driven and with instrument records.
- (5) 1920-1939. Eagle III and IV—Improvements on Eagle I.
- (6) 1942. Eagle V, VII and IX—Electrically operated, automatic, self-contained motor and instrument records. Perforated film.



Development of the Reconnaissance Aircraft Camera

of cameras for Military and Survey Air Photography for over a quarter of a century.

They originated the automatic type of camera with remote controls now universally adopted.

The development from the F.1 to the F.49 is graphically shown in this illustration. The latest type, the F.52, developed by R.A.F., is a further evolution of the large picture size.

As mentioned in the lecture, the F.24 in various guises, is the general

The unit system has enabled production of the cameras to be undertaken by a number of dispersed manufacturers organised around the "parent" firm.

Williamsons have also specialised for over twenty years in the manufacture of automatic photographic processing plants, originally for cinematograph film, but in later years for paper on an increasingly large scale.

A quantity of specialised machines were made in the early days of the war for repetition printing from F.24

negatives, 5in. x 5in. in diameter. Now, however, an entire machine has been produced called "Multiprinter," based on experience gained with the earlier machine, which the speed of production of prints has been doubled, in which all sizes of aircraft negatives can be successfully printed. In connection with the development of this type of equipment, Williamsons have acquired the business of Ellis Graber, of Tunbridge Wells.

Apart from the use of the "printer" for the mass production of contact prints from air photographs, the "Microprinter" deals with the production of prints by enlargement from smaller films.

This summary illustrates graphically the development of aircraft



The remarkable qualities of the British aerial cameras have resulted in their use not only by the R.A.F. and Empire Forces, but also by the Air Forces of the U.S.S.R.

This picture shows the R.A.F. type F.2 camera undergoing final assembly and test at Messrs. Williamson's factory.

Courtesy British Council

aircraft cameras since their introduction in 1916, and it is interesting that the first camera constructed by Mr. Colin Williamson two years ago incorporated perforated film and instrument records.

Manchester A.P.S.

We acknowledge with much appreciation an invitation from the Manchester Amateur Photography Society to local members of the R.A.P.S. in the outings arranged by M.A.P.S.

The Rambles and Joint Secretary, Mr. N. L. Williams, A.R.P.S., of "Two Trees," 2, Drive, Rosehill, Marple, will send full particulars to members interested.

Cinematograph Film (Control) Order, 1943

In pursuance of the Cinematograph Film (Control) Order, 1943, the Board of Trade have granted an Open General Licence (S.R. & O. 1943 No. 718, obtainable, price 1d., through any bookseller or news-agent, or direct from H.M. Stationery Office, Kingsway, London, W.C.2), authorising any person to supply or acquire:—

1. Unexposed cinematograph film or contact prints having a width not exceeding 16 mm. and being perforated along both edges.
2. Exposed or unexposed cinematograph film having a width of 9.5 mm.
3. Prints of any description, made before 8th April, 1943, having a width not exceeding 16 mm.

Until further notice, therefore, photographic manufacturers, laboratories and dealers will be at liberty to supply the above without obtaining individual licences for each transaction under the above mentioned Order. The Open General Licence, however, will not affect the operation of the Limitation of Supplies (Miscellaneous) (No. 19) Order, 1943. 16 mm. sound film and 16 mm. reduction prints (including reduction negatives) are excluded from the scope of the licence, because the processing capacity of the laboratories which handle this class of work is at present insufficient, having regard to the pressing requirements of Government Departments.

Letter from America

Our Honorary Foreign Corresponding Member of Council in New York, Mr. Joseph M. Bing, F.R.P.S., writes: "Photography is not abating here. There are many shows, some of them indicating a deepening of conception and better quality, which contrasts favourably with the pre-war period with the up-surge of interest and ease of obtaining—and wasting—material. More concentration benefits craftsmanship and art. The war-note has become all-embracing, and "arty" pictures command less publicity. Some shows are even criticised for the absence of references to the current all-absorbing war. And surely this war must have supreme attention, concentration and service.

Again and again I wish to mention that great improvements and new processes are in Governmental use or in blue-print stage among the manufacturers, which will affect—favourably—the future of photography. These things are not yet open for discussion.

The Oval Table Society has elected two new Associates: Thomas Moloney, owner and editor of the *U.S. Camera Magazine* and of the *U.S. Camera Annual*, and Harold M. Bennett, who has achieved much

Members need not refrain from responding to this appeal on account of any private or personal reasons, as the film image is utterly destroyed during the process to which the film is subjected.

LESLIE HOWARD

The loss of Leslie Howard with the passengers and crew of the ill-fated air liner which was bringing him from Lisbon is a severe blow to the stage and screen.

He was to have addressed The Royal Photographic Society at the Royal Institution on June 19th, an event to which a large

number of members and friends were looking forward with the greatest possible interest and pleasure.

Unfortunately the hazards of war decreed otherwise, and it was decided to cancel the meeting, since any substituted arrangement for the occasion was inconceivable.

in a long connection with photography to induce America to use better cameras."

Film Salvage

An appeal has been made by Guy's Hospital, which warmly deserves the support of photographers.

There is a great demand for film base as salvage, and it is urgently necessary in the national interest that it be met. The base has important uses in direct association with the war effort, and every film—not glass—negative that can possibly be spared is vitally needed.

The general funds of Guy's Hospital will benefit from the sale of exposed films sent to it, and we are confident that two such excellent objects as the provision of salvaged materials so vitally necessary to the war effort, and the support of one of the leading hospitals of the country, which, while it has itself suffered considerably from the war, has rendered such admirable service in alleviating suffering due to the war.

Will those who wish to assist these objects please send their used films to the Appeal Secretary, Guy's Hospital, London, S.E.1.

THE BOOKSHELF

The "Exakta" Guide. By W. D. Emanuel. The Focal Press, London and New York. Price 5s. 6d.

This is number four of "The Camera Guide," and is even more remarkable than its predecessors. By now we are accustomed to the breaking of new ground by The Focal Press, and we usually look for something helpful. In the "Exakta" Guide we have it in very full measure. One might think of the beginning and end of the book as the first example of mass observation applied to a camera. In the critique of the "Exakta," with which the book opens, there is a full and frank discussion of the advantages and disadvantages of the camera, much of which could well be applied to other models, and may well provide valuable material for the designer who attempts the hundred per cent efficient instrument. At the end of the book there are collected tabulated opinions from more than a hundred "Exakta" users, indicating those features which have pleased and those which have not, as also those subjects where the camera proved helpful, and those where it

was less convenient, and, finally, important advice to the new "Exakta" user, based on a large volume of actual experience. All the types of the "Exakta" are described, and every detail of its manipulation discussed and explained. Wherever possible line diagrams are used, and by now we are most of us well accustomed to the diagrams provided by The Focal Press. Tables of depth of focus, hyperfocal distance, exposure, fields covered by "Exakta" lenses, length of film required for any particular number of exposures, and others are provided. There are many full-page illustrations covering the very wide range of subjects to which the "Exakta" has been applied. Like its predecessors, this is a Guide in a very special sense, not only does it describe how to use the camera, but also why; nor does it stop there, for, as will have been gathered, there is a body of criticism that very greatly increases the value of the book, and adds one more precedent to the list of those which The Focal Press has provided.

H. W. GREENWOOD.

ANNOUNCEMENT

R.P.S. ANNUAL EXHIBITION

The following Judges and Selecting Committees have been appointed:

Section I. Pictorial Photography (Prints and Transparencies). (a) Prints: Messrs. Marcus Adam (Fellow), Bertram Cox (Hon. Fellow), J. Dudley Johnston (Hon. Fellow), Alexander Keighley (Hon. Fellow), F. J. Mortimer (Hon. Fellow), C.B.E. (b) Monochrome Lantern Slides: Messrs. Wm. A. Clark (Fellow), W. J. Foster (Associate), G. E. W. Herbert (Fellow), J. Dudley Johnston (Hon. Fellow), R. H. Lawton (Hon. Fellow).

Section II. Colour Photography (Prints and Transparencies). Messrs. G. Scott Bushe (Fellow), John Chear (Fellow), J. H. Coote (Fellow), John Hinde (Fellow).

Section III. Scientific and Technical Photography. Messrs. D. R. Barber (Fellow), A. J. Bull (Hon. Fellow), Herbert Flower (Fellow), G. A. Jones (Fellow), F. J. Pittcock (Fellow), J. H. Pledge (Fellow), H. S. Tasker (Associate).

Section IV. Natural History Photography (Prints and Transparencies). Messrs. E. J. Bedford (Fellow), Eric Hosking (Fellow), H. J. Howard (Fellow), Oliver G. Pike (Fellow), Hugh G. Wagstaff (Fellow).

Section V. Stereoscopic Prints and Transparencies. Messrs. G. E. W. Herbert (Fellow), J. Stuart Hills (Associate), A. S. Newman (Hon. Fellow).

Section VI. Press, Theatrical, Commercial and Advertising Photography. Messrs. Percy W. Harris (Fellow), F. J. Mortimer (Hon. Fellow), C.B.E., J. C. A. Redhead (Fellow).

The final receiving day is Saturday, July 24th. Medals will be at the disposal of the Judges in all Sections, except I and II. The Rodman Medal is also available for award in Section III, with special reference to Photomicrography and Radiography, and the Hood Medal for meritorious performance in any branch of practical photography.

The standard sizes for mounts are 20×16 and 16×12 inches, but margins must not exceed the dimensions stipulated in the Control of Paper Order No. 48 (approximately one inch all round) unless the prints were mounted prior to September 14th, 1942, when the Order came into force. (This stipulation does not apply to work sent in from overseas). If the mounts do not conform to the standard sizes, they will, if accepted, be attached, during the Exhibition, to mounts of these sizes, supplied by the Society.

In the Pictorial, Natural History and Colour Sections mounts should be white on cream, and in all sections, wherever possible, mounts of standard sizes should be used. When a series of prints illustrating one subject is to be shown, as many prints as may be convenient should be placed on one mount.

On account of the paper position the Entry Form is not being distributed with the *Journal* this year. It may be obtained upon application to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2 2s. 0d.; Group subscriptions, which became due

for renewal on the same day, are as follows: Science and Technical Group, 7s. 6d.; Pictorial Group, 5s. 0d.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s. 0d.; Kinematograph Section, 5s. 0d.

Group subscriptions may be included with the Annual Subscription, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscription to the Society through their own Bank to The National City Bank of New York in New York, or direct to The National City Bank of New York. Such subscription should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the National City Bank, Russell Square Branch, London, account. Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to mention their names, addresses and (Fellow, Associate, Member); and Members making remittance direct to The National City Bank, New York are requested to give this information.

It is important to note that payment should be made

"For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, 10, Abchurch Lane, London, E.C. 4."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

LECTURE PROGRAMME

Wednesday, June 9th, 7 p.m. EXHIBITIONS AT PRINCE'S GATE

Informal Meeting of the Kinematograph Section. "Preparing the Script." By Adrian Brunel, A.R.P.S.

Friday, June 4th, to Sunday, June 30th. (1) Group Members' Exhibit Prints of Spanish Cathedral Churches, by J. R. H. M.A., President, Trinity Oxford; (2) American War Information. "Can War be Won?" by Edward Weston.

Monday, July 4th, to Sunday, July 31st. (1) Presentation Prints by Reader Amateur Photographer; (2) Photography (arranged by Colour Group).

Saturday, September 25th, to Sunday, October 23rd. R.P.S. Annual Exhibition. Final receiving day, Sunday, July 24th.

Wednesday, July 21st, 7 p.m. Informal Meeting of the Kinematograph Section. "Present Day Film Constructing." By Fred Watts.

Saturday, August 7th. A visit to the Film Studios at Denham. Arranged by A. W. Watkins.

THE SOCIETY'S HOME

The Society's Home, Prince's Gate, S.W.7, will be open from 10 a.m. to 8 p.m. on Friday, and from 10 a.m. to 6 p.m. on Saturday, until notice.

THE PHOTOGRAPHIC JOURNAL

OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND
THE PHOTOGRAPHIC ALLIANCE

HONORARY ADVISORY EDITORS.—*Scientific and Technical Section*: C. WALLER, M.Sc., A.I.C., F.R.P.S.
Literary Section: J. DUDLEY JOHNSTON, HON. F.R.P.S. *Kinematograph Section*: ARTHUR S. NEWMAN, HON. F.R.P.S.
EDITOR: H. H. BLACKLOCK, F.R.P.S.

VOLUME
CXIII

JULY, 1943

TWO SHILLINGS
AND SIXPENCE



AVILA CATHEDRAL. NORTH CHOIR AISLE, LOOKING EAST
From the Exhibition, "Spanish Cathedrals and Churches," by J. R. H. Weaver, M.A.



Illustrating the effect of repetition

PICTORIAL PHOTOGRAPHY

WITH SPECIAL REFERENCE TO LANDSCAPE

By A. E. Lockington Vial, F.R.P.S.

At the Joint Meeting of The Royal Photographic Society and the Leicester and Leicestershire Photographic Society, held at the headquarters of the latter Society, Waterloo Street, Leicester, on January 5th, 1943, an interesting lecture on "Pictorial Photography, with special reference to Landscape," was given by Mr. A. E. Lockington Vial, F.R.P.S.

The lecturer illustrated his remarks with examples of his Exhibition work, a few of which are reproduced with this report.

The chair was occupied by Mr. E. Tyler, the President of the Leicester and Leicestershire Photographic Society.

SINCE the early days of Daguerrotype likenesses, which must have given the sitters great pleasure, photography has progressed along many paths, and in some way has permeated almost all walks of life, and become, it might be claimed, essential in each. In all branches of science it has gradually become the guide, the discoverer, the indispensable assistant.

In Art it has taken a place, hotly disputed at first, but now almost universally acknowledged, in which it ranks high as a means of artistic expression. The photographer, whose aim is to create pictures, differs from the painter only in the medium he uses. Their objects and ideals are identical, only the means of attaining these are different. They

both desire to stir up within the beholder of their works a similar emotion to that which they themselves experienced when visualising their subject. The source of inspiration may be the same, but the finished works will not be identical, as each medium has its own limitations and each artist his own individuality.

In either case he must be master of technique, i.e., master of the particular methods of working which he finds most suitable to himself and to the particular type of subject with which he is dealing. He should not, however, be a slave to technique alone, for this is not the point of primary importance in the consideration of a print.

It has been said that what appears

to be typical of English Art is insistence on workmanlike technique, a meticulousness as to how a thing is said, rather than what is said; a preoccupation with material, rather than the spirit (Wadsworth).

There is a certain degree of this, but the artistic aim should not be hampered by inefficient technique and should never be modulated on account of difficulties which can be overcome. In other words, the photographer should be so well mastered that the photographer is not preoccupied with it, but is able to give free rein to his imaginative-artistic-creative

It is this artistic aspect of photography with which we are concerned this evening, and my remarks will be chiefly referring to landscape, though chiefly referring to landscape, though all branches of pictorial work are also applicable on broad

Art has been defined as the stimulation of the senses, in order to give pleasure. In the case of the artist, the sense is, of course, vision. The artist sees, the combination of his actual sight and his mental vision, the thing which stirs him deeply, endeavours, by means of his work, to pass on the experience to the beholder. The artist finds pleasurable, success depends on his ability to evoke sympathy in the beholder, or, expressed in parlance—"to put it across."

A picture contains interest of two distinct kinds: (a) human interest, i.e., interest in the subject matter itself, irrespective of how it is treated; (b) æsthetic interest, i.e., interest in its artistic value, its line pattern, its tone scheme, its mood, in other words, what is called its spiritual value.

One of our moderns, P. G. Wodehouse, writes, "There seems to exist in the frank expressions of portraiture, an imprisoned spirit, the spirit is the source of the power which animates Art. The vehicles of this spirit are only reflections of images, somehow, they are inadequate."

There is, in some, particularly among moderns, a tendency to try and represent a scene without the spirit of a scene without the accuracy of the representation used to build up that picture. This is not altogether satisfactory. Attention is called to the accuracy of the representation, the slovenly drawing of objects in the scene, and this, in a way, defeats the object of the creation. Poor representation of objects, to the shape of which we are accustomed, becomes irritating and distracting. The correct representation would

re, the effect of the whole is appealing as it might be.

making of a pictorial photograph, then, does not begin in the moment, it has its origin in the mind of the photographer before ever he makes his exposure. He may be attracted by a splash of sunlight on a wall or in a street, by the vista offered by a landscape, by the suggestion of a countenance, by the movement of certain inanimate objects in which he is interested, by the dramatic effect of a threatening sky, by a grouping of figures, or by the presence of a figure or tree.

Each attraction constitutes recognition of possibilities, and this recognition is the first essential in the pursuit of picture making. Individuals vary greatly. Some are attracted towards one type of subject, others towards another. One may see possibilities where another passes on without having experienced any particular interest. This is as it should be. Each picture produced should be individualistic and not a slavish imitation of other workers' styles or methods.

Each should interpret that which appeals to him personally. Recognition is only, as it were, the starting point. It is followed by selection—a deliberate and carefully considered decision as to the material to be included, what should be avoided or excluded, and the angle of approach. This should all be considered by the project in mind, by the photographer aspires to achieve, of the subject, i.e., by the visualisation or idealisation of it. It must be remembered that a beautiful piece of scenery does not automatically lend itself to the making of a picture.

The word "deliberate" is used frequently. Where street scenes, crowded groupings, moving objects and changing conditions are involved, decision must be prompt, "snappy" if you like, in other words, recognition under such circumstances as these must be followed immediately by selection and quick

action. In landscape, portrait, and still life photography, however, find it advantageous to study their subject after the event, and to linger, not to snap, without the pleasure of waiting, or a tinge of excitement, the final selective operation and final exposure.

Photographers are not unknown, with their miniature precision instruments, snap one view after another in the hope that out of a long series of exposures they may at least obtain one or two negatives worthy of development, perhaps for exhibition purposes.

The true photographic artist is unable to do this. He needs time for the careful consideration of his subject, and for securing such a position for himself and his camera that he feels will give him the best results he can obtain under the circumstances. It is not that he is niggardly in the use of his negative material, but that there is that sensation within him—almost uplift—often excitement—which prompts him to try and produce by means of the material before him a picture which he visualises in his own mind, in other words, a creation rather than just a record.

In order to produce his imagined effect, the painter will strengthen a shadow here, subdue the distance there, omit an ugly intrusion, alter the position of a tree or figure, and so on. What is easy for the painter is more difficult for the photographer, but the latter must try and produce his own idealisation in his own way.

The portraitist studies his subject minutely, watches with an alert eye for changes of expression, and endeavours to produce, not merely a likeness, but a portrait conveying impressions of character as he himself observes it in the living, changing countenance.

The still life worker, or flower photographer, spends considerable time in arranging his objects and manoeuvring his lighting until he gets them finally grouped or placed in accordance with his visualisation of the desired result. The mere record in itself is lifeless, but the artistic production reflects more than the record, it has a more interesting, more complete story to tell. The record leaves the beholder cold, but the true picture, through its enhanced æsthetic quality, calls up in a greater or less degree, a feeling in the beholder similar to that of the producer.

Herein lies the foundation of the pictorial photograph. It commences



In this picture the soft and subdued line of the horizon should be noted



This picture illustrates recession of planes and the sense of movement suggested by diagonals

with activity in the mind of the photographer: recognition of possibly suitable material, deliberate and careful selection, combined with visualisation or idealisation of the desired result.

Thus, in order to produce work worthy of note by observers, the photographer needs constantly to train and school himself in all the qualities and sensibilities which will help him to create worthy visualisations.

Recognition depends very largely on preferences for certain types of subject. Progress can be made in this connection by open-mindedly widening the circle of interest with regard to subjects by experiment and comparison, as mere likes and dislikes, though helpful in a measure, are insufficient in themselves.

Selection, however, can be very definitely trained by observation of fine pictorial work, by noting forms of construction favoured by leading pictorialists, and by observing certain fundamental rules which have been deduced from the pictorial methods of great workers of the past, whether painters or photographers, which give suggestive guidance as to how to arrange the subject matter available in order to secure the most telling, and at the same time, the most satisfying results.

It must be remembered that one of the greatest aids to synthesis is analysis. The examination of the component parts of fine prints, of their lay-out, of their lighting, enables one more easily to visualise a

creation based on elements which may be encountered, suitable for pictorial expression.

Foremost among the points for consideration may be placed the direction of the principal lines—lines formed by the outlines of the masses—the linear pattern, or, as I prefer to call it, the linear scaffolding, i.e., design used structurally.

Our field of vision is approximately a hollow cone on its side. In a scientific drawing the eye—a lens—would be placed at the apex of the cone, the base, representing the field of vision, in the distance. This is correct in studying light, but when considering pictorial work the diagram must be reversed. The eye—at the centre of the base, which represents the sense of space around the observer, looks along a straight line to a point in the distance—the apex. Although conscious of many objects around that principal point, the eye has to be definitely re-directed to any one in order that it may be observed accurately. Whenever this re-direction takes place, the straight line which forms the axis of the cone is moved, and thus the whole cone takes a new position, and all lines running away parallel to the axis appear to converge upon the new apex.

The immediate field of vision is limited by the circle which forms the base of the cone. If this field be further limited by the conventional lines of a rectangular picture, the result is a square-based pyramid, instead of a cone. Should a portion only of this square be used—say, a

central panel—the lines of need adjusting, otherwise the unnatural and awkward. It is probably why lines going out sides of a print are much less satisfactory than if they make exit the corners.

The study of perspective that, viewed from the usual vertical lines remain vertical receding horizontal lines gra run apparently together as the into the distance.

Horizontal lines running to the eye, however, do not va the same way, as they rema or less at the same distances fr point of vision. Hence stron zontal lines across a picture always pleasing, but sometime annoying. This makes some t landscape and seascape very d and if the horizontal line n included, it should be toned do thrown as far as possible i distance.

In certain types of subje necessary to watch that the ing point is not blocked, of the eye has a feeling of thwarted. It is especially a in woodland scenes that the allowed to find its way throu

In addition to these vanish the principal lines may tak forms, each of which may be on its merits, on its suitability subject, and on its conforma greater or less degree to the nised general trend of lines o

The lines which are rega most useful, perhaps the most ful to use, are dealt with ver estingly in the little book, published by the R.P.S., I eminent pictorialist, Mr. J Cox, Hon. F.R.P.S., which mend to the attention of wish to improve their pictori

The most evident lines sho the eye to the chief centre of and whereas some lines ma haps of necessity, lead the eye the margin, the detractio nullified by use of a foil of sor which breaks across the li allows the eye to return and in the picture.

So important is this cont direction forming the basic that some workers aim at lin as if it were the whole probl in pictorial work this is insu Certainly the lay-out is of pa importance, for without a goo design there cannot be a goo but the addition of other int needed in order that the result valuable as a pictorial effort

There should be balance o —not equal balance—for to equality has a tendency to b

weariness of monotony, but a balance nevertheless.

There should be, too, a similar kind of balance of light and shade, a tonal balance as it might be called. Here, again, we have an important additional interest to the linear pattern or design. Lighting should be such as to give good modelling. Rather than behind the camera, which the earlier emulsions and lenses made necessary, the source of light should be to the right or left, and the long shadows of early morning or late evening are often a great asset if skilfully utilised.

Good lighting should, generally speaking, yield a gamut of tones ranging from rich black, through all degrees of greys, to the white of the highest light, none being so heavy or so light as to prevent the suggestion of detail.

Tone control is very important, enabling concentration to be directed to the desired point of interest. Woodland scenes frequently prove failures because of the lack of differentiation in tone values. To the eye the slightly different shades of green are sufficient to separate the various planes, but reduced to monochrome, the differences in tone are so slight that the result is often flat and uninteresting. Slavish attempts to render absolute colour values in comparison one with another are unnecessary, for the finished print is intended to be an artistic production, tone values being dependent upon the desired results aimed at, not upon the demands of an exact record.

In making use of a long range of tones, it must be borne in mind that in addition to linear perspective, there is also a perspective of colour. When a painter wishes to relegate certain parts of his picture to the far distance he uses less and less strength of colour, and thus his remoter portions become paler and paler. The photographer needs to watch the same effects in his work. In photography, this perspective of colour is often spoken of as the recession of planes. If the distance is printed out too heavily or darkly, it advances and fails to give the desired effect. If, on the other hand, it is lighter in tone, weaker, even faint and hazy, it recedes and gives much greater depth to the scene.

Of course, there are exceptions to this inclusion of a long range of tones. Beautiful results are sometimes obtained by the use of light tones only—high key work, as it is called. But here a slight accent is needed to capture the eye and create a centre of interest, concentration being secured by a contrasting darker tone. Low tone subjects, however, breathe more warmth, more life, more strength, and

at this other end of the scale, modern painters, as well as photographers, frequently utilise chiaroscuro, i.e., brilliant sunshine adjacent to deep shadow, to produce striking and dramatic effects in their pictorial work.

Photographs taken against the light are often very pleasing, but care has to be taken to prevent the portions in deep shadow from losing too much detail, as the result of blank spaces in the negative.

All these factors—line, pattern, balance of masses, distribution of light and shade, and accent or concentration of interest, influence another important consideration—the position of the principal object or point of interest in the whole. The well-known division of the rectangle into nine portions gives very good guidance as to the recognised best positions to be aimed at, but the leading lines must also be allowed to play their part in fixing this point.

The concentration of interest on one particular object or figure makes it essential that both background and foreground be watched, in order that they may play neither more nor less than the part assigned to them, and if by subsidiary interests a sense of rhythm can be introduced, so much the better.

The question of definition and depth of focus is all-important here. The whole of a picture need not necessarily be in sharp focus all over. The principal object should be quite sharp, while a little softening of the background or distance is advisable. One sometimes sees an object taken with the background very much out of focus. This may be necessary in photographing a rapidly moving

object, or a bird alighting near its young. The wide aperture necessary to secure this throws the background out of focus. But in pictorial work this fuzzy background is irritatingly distracting to the eye, and such modification as is deemed necessary should be secured by other means, e.g., by toning down or lighter printing. In looking at an actual scene, the eye does not have everything in focus when directed to the principal object, but adapts its focus immediately upon being directed to some other part of the scene. In a picture, what is out of focus when the eye is centred on the principal object remains out of focus when the eye travels to it, and thus a blurred background may very well be irritating to the beholder, the eye being arrested by its failure to adapt itself to the distance to which it has been directed.

It must be realised that these varied considerations—the linear scaffolding or line design, the lighting, the balance of masses, the position of the main point of interest, cannot be taken into account before exposure without a definite realisation of the boundary of the intended picture. This is very important, for within the determined bounds there must be a complete and perfect whole, a unity in itself, satisfying and entire, like a literary quotation which needs no support or illumination from the context from which it has been taken, in order to express the wisdom it contains—as, for example, Pope's "To err is human; to forgive, divine."

The simpler this unity the better, for there is often, especially in landscape work, the danger of including too much, in which case, when this is



The direction of line is happily illustrated in this picture



An illustration of the strength of the upright line

afterwards realised, the print has to be cut down and a new boundary set up. The photographer must endeavour to visualise the finished print, and see it as others will see it taken out of its context, as it were, i.e., without the surroundings in which he saw it before he made his exposure. Hence his preliminary effort is of the utmost importance. A better stance may be available only a few feet or a few inches away; a slight variation of the angle might be an improvement; the inclusion or omission of a certain object such as a tree; the direction of the lighting and disposition of the shadows; the lie of the foreground, the suitability of the background; all these, in addition to technical considerations of aperture, filter and exposure, need not only concentration but the expert comparison and judgment of the appreciative and practised artistic eye. A pleasing panorama may yield very little of pictorial value when dissected and examined. In including much there is always the danger of the eye being confused by being led away from the principal object to others appearing almost, if not quite, equally attractive. Unity is achieved when lines leading the eye converge on the principal theme, and prevent a diffusion of interest, often a very difficult proposition in landscape work. All irritating counter-attracting patches of light spots should be subdued in order to secure harmony.

The trimming of a print to reduce the content, which often proves necessary, has the effect of accentuating the main theme, by bringing it

into greater prominence and by cutting out points of counter-attraction, thus tending towards greater simplicity. At the same time, it should not be so severely dealt with that the original idea has to be abandoned or altered to suit the smaller area.

Photography began with the reproduction of merely visual material forms, but on its artistic side it has now risen far beyond this, and aims at more intellectual and æsthetic creation. The true picture contains more than the representation of the actual object or scene, it suggests a feeling or emotion. This is often spoken of as mood or atmosphere, and it is this quality which lifts the print definitely out of the record class and helps to make the picture a creation; in fact, herein lies the spiritual attribute of the work.

The direction of the principal lines may also influence the "feeling" of the picture. Vertical lines denote strength and stability; horizontal lines peace and quiet; slanting lines introduce alertness, life, movement; while curves are suggestive of beauty and grace.

In portraiture, the required mood—difficult to express—is the display of character. In landscape, many moods are possible—the discomfort of a rainy day, the threat of an approaching storm, the peace of a quiet evening, the mawk of a November day, the enduring strength of an old ruin, the bustle of a busy street; all these, if successfully portrayed, turn what might be merely a record into a print expressing something more than the mere scene photographed.

This capture of mood in landscape or character in portraiture, is no easy matter, for the photographer is endeavouring to crystallize as permanent that which by its nature is evanescent and fleet.

A word must be included in connection with photographic print colour, which, though undoubtedly making progress, still has a long way to go. Prints in colour need linear construction, balance, atmosphere, just as much as do chrome prints. The fact that they have been more or less faithfully rendered is only a technical success, not a pictorial success. A selection of colours has to be not merely a range of tones, although we are frequently told that colours never clash in the same arrangement of tones, likely will do so in a picture. An expert gardener takes no chance, endeavours to mass his colour groups which harmonise with a definite colour scheme. The photographer would do well to take his example and beware of the confusion of a variety of brilliant or close proximity. The colour, therefore, has an added difficulty compared with the monochrome worker, in as much as a variety of colours may tend to destroy harmony and unity.

It is sometimes asked, "afterwork is legitimate for a pictorial photographer?" The reasonable answer would appear to be—anything he feels justified in doing in order to secure the result he had in mind when making his exposure, provided his methods and intentions do not call attention to themselves as such, or in other words provided the technique is good does not mean that a systematic alteration of prints is advised. The artistic urge should occur before exposure, and if the desired result can be obtained by means of a straight print, so much the better. Success is achieved only when the spirit of the picture is apparent and felt by the beholder in sympathy with what the artist has endeavoured to express.

There is to-day, as there is among pictorialists, both amateur and professional, a great deal of originality. This has led to cases to what are sometimes "stunt" pictures, but tellings have been achieved by treating unusual objects pictorially, have succeeded in producing designs by photographing from an unusual angle. Other copied these methods more successfully, but, as one of our critics has remarked, what is



A mood of Nature is suggested by this landscape

vidual individuality, not individuality." However, the artist who persistently endeavored to raise the same feelings in his finished work as he himself when he first visualised his work will certainly have his work with his own outlook, i.e., his own personality, and the creative instinct will

inevitably result in vitality in his productions.

What progress is being made in pictorial art, and what of the future? The theory of evolution, evidence in support of which has been accumulating through all branches of science during the past few decades, gives us a vision of constant striving from the period of the simple cell to man's

present stage of greater or less perfection. It would appear that man's physical evolution has reached its limit, but the process still continues through his mental and spiritual development.

Art in its various branches affords some of the tracks along which development may proceed. The study of pictorial art from the crude line-drawings executed by primitive man on the walls of his caves, up through the works of the great painters, shows development alongside man's mental progression. We see side tracks, abortive efforts, perhaps, but all have their influence on the main route.

Before the war, diversities of outlook and efforts of opposing forces appeared to have brought our world to the brink of disintegration. One of the beneficial results of this great cataclysm of war will almost surely be, we must all hope, an indication of the course to be pursued in order to achieve unity and concord.

So in the world of Art, the present diverse and conflicting tendencies may well be the precursors of some great advance which we are as yet unable to visualise. It is certain, however, that all who are earnestly endeavouring to produce work of high individual quality are contributing in some measure, however small, towards a more extensive recognition of aesthetic qualities and towards a more widespread understanding and appreciation of spiritual values.

H CAMERA AND RUCKSACK IN SNOWDONIA

By R. W. Chaney, LL.B.

A Joint Meeting of The Royal Photographic Society with the Liverpool Amateur Photographic Society, was held at the headquarters of the latter Society, on November 22nd, 1931, when Mr. R. W. Chaney, LL.B., spoke of some of his climbing and photographic experiences in North Wales.

The chair was occupied by Mr. W. T. Dawson, who said in introducing the lecturer, many of them were familiar with the district which was the subject of the lecturer, as North Wales was so readily accessible from Merseyside.

In his opening remarks Mr. Chaney said that he was first and foremost a climber and a mountain lover; he did not use whatever for horrible sorts like Blackpool, where they spent huge sums of money in the slot machines, and they were enjoying themselves. A holiday was not a holiday if you could go and disappear into the hills, and have as his friends a stout pair of boots, a rucksack, and, of course, a

There was a strange fascination about mountain fastnesses, which grew the more one wandered about among them. He expressed the hope that by lecturing about the countryside it should be possible to stir up a far greater interest in its preservation from the various forms of spoliation which always threatened. No apologies were necessary for introducing a little propaganda, because the British Isles could show a far greater diversity of attractive scenery than any other area in the world of comparable

size, and it was everyone's duty to take some part in helping to prevent unchecked "development." He believed that the establishment of National Parks would form a very important part in developing the new world which is being promised for the post war period. The Snowdon district was high in the list of proposed National Parks.

The first few slides showed some familiar views of the Conway district, including the pre-war illumination of the famous castle and bridge. The



Sunshine on Conway Castle

audience was here reminded of the pre-war scheme to bye-pass Conway Centre and construct a new arterial road along the front by the "smallest house in Great Britain." He hoped that Conway would never be spoiled like that, and that the scheme would become a war casualty.

The mountains were introduced by a view southwards from the Holiday Fellowship Guest House, Bryn Corach a fitting introduction, as Mr. Chaney himself had made acquaintance with the mountains through that organisation. Our geography was revised by a map of Snowdonia, and we were shown an approximate route of our tour. It was not really one tour, however, the lecturer had altogether spent about seventeen weeks and a dozen long week-ends in the mountains.

A long distance view of the Snowdon range, taken from the south-east side of the Lledr Valley, about ten miles away, was made into a slide by novel makeshift when his supply of plates became exhausted. A contact print was made on a $3\frac{1}{2} \times 2\frac{1}{2}$ process plate, and the gelatine was then floated off in a solution of potassium carbonate and formalin. A spare lantern glass was then slipped under the floating film, which was lifted out and allowed to dry on the glass. Although this was useful in an emergency, Mr. Chaney said, it could not honestly be recommended as a new way of slide-making!

We soon found ourselves among the craggy mountains of Nant Ffrancon, so well known to all who visit North Wales, and which probably form the wildest mountain group south of the Border. Most of the members who knew the district probably agreed

with Mr. Chaney when he said that photographs hardly did justice to the Ogwen mountains, and that it was extremely difficult to convey by a photograph the wild desolation of the almost precipitous rocky wall forming a huge semi-circle round Idwal lake. The tops are a wilderness of broken-up loose rock, and richly deserve the description of the "roughest tops in the country." One of the lecturer's most vivid recollections of the Glyders was of seeing a beautiful summer sunset from the summit of Y Garn, when, after a day of low grey cloud and heavy rain, the weather cleared, and he climbed to the summit to find himself above the clouds. There was a sea of broken cloud hanging motionless in the

valleys well below the sun, more clouds draped over like patches of cotton wool and beyond, a brilliant red was a sight to be remembered. Mr. Chaney thought it would have been a pity to have diverted all those people who were why anyone should bothy a mountain. It was quite to "capture" that sunset, it on to the screen, even slide was tinted. Different had different ideas as to correct colouring in slides, so the best that could be was to make it as nearly resemble what the photograph. Mr. Chaney hoped that it would not be too critical at colouring, as he had started experimenting with

So we left Y Garn, Llanberis, with its novel waterfall, Ceunant Mone does not have to Llanberis is not exactly being sadly spoiled by the quarries of Elidir Fawr, about 2,300 feet up the side. It was the largest in Wales, with an area of acres. Sometimes, however, particularly after a wet, the setting sun shone on the quarry faces, the different slate were surprisingly be the various shades of purple and green are most striking.

Snowdon was obviously the lecturer's favourite, just number of shots taken from which next appeared on Mr. Chaney said he did not other mountain mass of land—and not many either—could show such



"Sunshine and Cloud." Tryfan and the Carneddau from Glyder Fach



Lliwedd (2,947 ft.) from Llyn Llyda

variety of different aspects as Snowdon, and from each direction was a particularly shapely, massive and beautiful mountain. It did not include the Llanberis Pass, however, which was most dull and uninteresting, and which should have been used as a starting point for the ascent. The various views from the summit were deservedly famous, particularly the well-known view from Curig, with the four peaks of the Snowdon group, and the surrounding hills, and so were the various views from the base of the mountain, inside the great horseshoe of the Snowdon range, with the two lakes of Llydaw and Llyn Dinas, and the majestic heights of Lliwedd and Snowdon. Then the lecturer spoke of the famous skyline of Snowdon, about which so many fear-ful accounts have been written. It was nothing really dangerous, unless one tried to show off by walking along the extreme edge. It was asking for trouble, as the mountain was likely to break off in small pieces, and if you were standing on those pieces when it did break off, you probably lost all further interest in things! Here he reminded us that there was nothing particularly dangerous in mountain climbing; most of the accidents reported in the popular press liked to

display in large headlines were caused by ignorant people who knew nothing about mountains, thinking they could wander about as easily as in the fields. There was a right and a wrong way, as in everything else; if you did it the wrong way you were likely to come to grief; but if you did it the right way you would go on climbing mountains as long as Anno Domini would allow.

The summit was reached in particularly clear weather. It was clear on the summit sometimes; in fact, Mr. Chaney had made eight ascents out of twelve in perfectly clear weather. We descended by the well-known and well-marked Watkin Path, pausing for a moment for an impressive close-up of the great sweeping precipice of Lliwedd, a favourite winter practising ground for many famous climbers, including some of Everest fame.

And so to the Vale of Gwynant, which forms the south-eastern boundary of the Snowdon mass. This was a pleasant change from the rugged mountains we had seen so far, and Mr. Chaney thought that Gwynant was as beautiful as the very best in Lakeland. The two charming lakes of Gwynant and Dinas were set among delightful wooded scenery in the floor of a very deep valley, with the great ridges of Snowdon on one side, and the confused mass of rocks around Cynidr and Moel Meirch on the other. At the lower end of Llyn Dinas was a small, insignificant little hill, called Moel Dyniewyd, 1,254 feet high, and extending to the Aberglaslyn Pass. This was well worth a visit, as the view of the surrounding mountains was most impressive. In particular, Lliwedd appeared to be a far higher mountain than it really was. Many of these small hills prove to be wonderful view points, and well worth exploring by anyone who wanted to see the most of the countryside.

We were then taken to the comparatively little visited western side of Snowdon, around Cwellyn Lake. Mr. Chaney liked this district very much; the peaks were not high when compared with the other Snowdon mountains, but they all had conspicuously different shapes and outlines,

and each group was separated from its neighbours. This was one reason why Mr. Chaney liked North Wales so much, each mountain had a distinctive outline, and was in some way quite different from the others. He thought this was where North Wales scored over the Lake District, where the hills and mountains were crowded together so closely that individuality was lost.

He also showed us a few slides of the Festiniog Railway and the now extinct Welsh Highland Railway, and our tour of the mountains ended at Harlech. After seeing the familiar castle the lecture closed with a peaceful sunset from the seashore, which could aptly be described as "the end of a perfect day" and "Peace, Perfect Peace."

Mrs. J. H. WILLIAMS, who proposed a hearty vote of thanks to the lecturer, said that, in her opinion, love of the hills was something in the blood, and there was no doubt at all that Mr. Chaney was a true mountain-lover.

This afternoon we had been transported to the tops of the hills without the exercise of any energy, but were able to see vast spaces and glorious viewpoints that so enthralled the lecturer. Indeed, the keen wind of the mountains blew through Mr. Chaney's bracing talk, which combined love of natural beauty, interesting historical and geographical items, some details of the mountain railways, and a plentiful sprinkling of humorous anecdotes. The many beautiful slides had been as thrilling to those who knew the district as to those who were unacquainted with the scenes described.

She congratulated the lecturer, too, on his Welsh pronunciation (about which he was inclined to be modest), and, in expressing the Association's grateful thanks for a delightful afternoon, she hoped that Mr. Chaney would soon realise one of his ambitions, which he admitted was to see the top of Snowdon in snow.

Hampshire House P.S.

Considerable sympathy will be felt with Hammersmith Hampshire House Photographic Society in the misfortune which recently befell it making its premises temporarily unusable.

Knowing the enthusiasm and energy of its members, we are confident that it will successfully emerge from the ordeal.

In the meantime, accommodation for its meetings was quickly placed at its disposal by the Camera Club, where, until further notice, they will be held at the Club premises at 11, Grosvenor Street, W.1.



The Mountain Road between Seres and Drama

A GLIMPSE OF GREECE

By E. S. Tompkins, B.Sc., A.R.P.S.

THIS is a second of the episodes of the lecture "So I Got Out My Camera," a previous section of which, entitled "White Horse and Cheese Rolling," was published in the May, 1942, issue of *The Photographic Journal*.

The lecture was given to a joint meeting of The Royal Photographic Society and the Birmingham Photographic Society, held at Birmingham, on March 21st, 1942, with Mr. F. G. Ratcliff, President of the Birmingham Society, presiding.

THIS is not the story of an ordinary trip to the Acropolis, and all the other much-photographed monuments of tourist Greece. A year or two before the war, the writer made a road journey into Macedonia and Thessaly, and the pictures secured, some of which are reproduced here, illustrate the everyday life of the Greek people themselves.

The journey lay first in Eastern Macedonia, across the fertile plain of Seres, where an American firm were busy on a huge irrigation scheme, intended to tame the great torrents which descend from the nearby mountains, in time of storms, and rush across the narrow seaboard plain. Then we passed over the mountain road to Drama, an import-

ant market town, with its innumerable gossiping groups, and down to the sea at Kavalla, with its cobbled streets and typical Roman aqueduct, the port to which all the tobacco grown in the region is taken by the absence of any railway. Here we saw a man with a *tespik*, the string of beads which so many people in Eastern Europe carry, and which is usually taken at first glance for a prayer. In actual fact, it is only a thing, something to occupy the fidgeting fingers, and with many it replaces smoking, even in the tobacco area, when times are hard.

We then returned to Salonika, a journey broken by a passage across a swollen river on a raft, both of which and rail bridges being swept away. Here the blue Mediterranean, bright and calm, comes up to the shore in front, and the pink cone of Mount Olympus, over 9,000 feet, is seen across the bay, apparently in the sunrise from the sea. Here we turned south, and on the journey back to Athens, by way of Western Macedonia, and Thessaly, we saw many times to photograph the ancient buildings and people. The little town of Verria boasts a fantastic number of churches, out of all proportion to its ten thousand inhabitants. The picture of the chief one shows a picture of the chief one showing with reasonable care, such as natural subjects can be dealt with on a 16-on 3½×2¼-inch film camera with no rising front or other "tricks." The picture was a lucky shot, obtained quickly when the car was being refuelled.



Kite over the Acropolis



Church, Verria

ing an appropriate local figure appeared at just the right moment. In all such cases a small camera with a quick self-loading device, and with the lens set down to $f/11$ or $f/16$ and the aperture set at the appropriate focal distance, gives the maximum chance of never missing a shot. Many of the Greek population had a childlike delight in being photographed, and the risk of being camera-conscious results in considerable unless obvious precautions were carefully avoided. As realised with mild surprise the fine engineered roads, of the type, winding through the plains were, in fact, built of marble, the most readily available material, from local quarries. Such modern highway construction contrasted strangely with sections of this trunk road from Athens to Salonika and the

North, where, down in the plains, the surface was of water-bound gravel, and where road and bridges were frequently washed away by floods, so that road travel was punctuated with breathless dives into swollen streams and water-courses.

Athens, in late February, was celebrating the end of winter and the coming of spring with a fortnight's carnival on traditional lines, before the rigours of Lent. This spring festival spoke eloquently of the joy of the people that the winter was past and gone, and that the earth was reawakening after its winter sleep, and that the seasons of warmth and fruitfulness were approaching. The celebration was essentially a people's affair and was not put on as an organised business for visiting spectators, as are many of the carnivals of southern tourist Europe. There were some organised fancy-

dress parades, especially of the children, but the greater part of the celebrations were informal, consisting of families and friends getting together to dance, in simple ring-o'-roses fashion, in the courtyards of their houses, in the streets, and up in the hills or collines between the city of Athens and the port of Piræus. Traditional Greek dresses were brought out, including the fustanella, that white kilted garment, worn by the men, which so much resembles a ballerina's tutu, and which is the full-dress uniform of the Evzone warriors.

Bands of dancers with beribboned poles, like the English Maypoles, went from street to street dancing and collecting from the passers-by. The carnival, lasting for a fortnight, grew in intensity to a great crescendo on the last day of all, which was the Monday before Shrove Tuesday and which was a public holiday. On this day the crowds went up to the collines, especially to the Colline de la Pnyx, where there was dancing all day long to the sound of the hurdy-gurdy and the gramophone. Sheep and lambs were roasted on the spit over open fires, while gipsies, acrobats and performing animals were busy entertaining the crowd. Everywhere the "while-you-wait" photographer plied his trade, especially among those in fancy dress. He used a card negative process, fixing the newly-made negative in a strutted holder in front of his camera and copying it on to another card while the client waited. Trick backgrounds in which the subject was shown riding a camel or a horse were very popular.

One of the most interesting features of the celebrations was the kite-flying of the boys. Early in the morning we met the seller with his stock of light paper kites, up to four or five feet across, climbing the steep road to the collines. There, in a fresh breeze blowing up from the sea, the kites flew readily out over the city towards the Acropolis, and as the day wore on the sky became dotted with them.

The whole scene was one of care-free relaxation in the warm spring sunshine, and it is thus that we like to remember the Greek people. We think of them now in bondage and in the throes of the famine which Hitler's New Order has brought to their beautiful country. We think of them after one of the most gallant campaigns of the war, quietly and confidently fingering those consoling little strings of beads and looking forward with fervent prayers to the greatest of all carnivals which shall celebrate the return of their freedom.

*Light on the Hills**H. M. Sheppard, A.R.P.S.*

THE PICTORIAL GROUP EXHIBITION

By J. Dudley Johnston, Hon. F.R.P.S.

TWELVE months ago I was disposed to regard the prospects of photographic exhibitions during the present year with some misgiving. It was difficult to believe that the restricted supplies of photographic materials would not within a twelvemonth bring about an almost entire cessation of output. Fortunately these fears have proved to be unfounded, and the Pictorial Group members were not only able to submit well over four hundred entries to the Group's exhibition in June, but to send the great majority in the normal 15 by 12 size. Of these, a total of 143 prints found acceptance by the Selection Committee.

The standard of the work shown was well up to the usual level, in spite of the fact that this is not an exhibition in which the chief aim is to make the most attractive display possible. Primarily, the object is to encourage members of the Group to bring their work forward in order that they may measure their strength against that of older and more experienced workers. Accordingly, every member who contributes has, if possible, at least one print hung, even if that entails cutting out some of

the entries by more famous photographers. Needless to say, this involves the lowering to a greater or less degree the level of quality of the exhibition as a whole, but is justified, since the intention is to afford encouragement to newcomers and the junior members. Encouragement is also given to experimental and original work in the shape of novel subjects or new processes. Fortunately, present conditions are not favourable to these objectives, and their realisation must perhaps be deferred to happier times.

When you have pictures by such eminent workers as F. J. Mortimer, Fred Judge, Mrs. Maingot and Mrs. Parsons, to name just a few, it would seem natural to devote this notice mainly to a consideration of the work of the less eminent members. On this occasion it was as explained the less eminent were the more important, so I must content myself with recording that they were well represented, and that pictures were the high lights of the show. Mrs. Parsons, however, merits a word of congratulation because she broke away from her normal landscape subjects to produce, in "Conversation Piece," something unexpected

ul. Mortimer also, in "The Channel Roll," and unhackneyed subject, although one that portable and attractive.

most notable contribution in some respects

Egerton Ryerson's "Wells," an interior famous cathedral seen in an original andanner. The print, however, did not do to the subject, being too sombre and lackingo that the total effect was rather heavy. rge Allan, of Port Glasgow, also produced of the common in "Cascade," in which the to the pattern made by the flow of water

bjects scored some successes, notably F. r Jar," with its ghostly Chinese coolie in nd, the dainty "Salute to Spring," by

R. M. White, and "Earthenware," and "Design," by J. S. Waring, the last two being notable for the fine quality of the prints. "Light on the Hills," by H. M. Sheppard, with its broad treatment and touch of mystery was one of the best of the landscapes.

Of figure subjects, Dr. Jouhar's "Jimmy" was notable for its realistic treatment, and Basil Bailey's "Joyce" for the dainty and decorative handling of the nude, but on the other hand, his "Jazz Background" was altogether to jazzy for my taste. G. Scott Bushe had three outstanding subjects whose technical excellence was remarkable. In "Elliptique," however, striking as it was, the interest of the very large hat shape hardly compensated for the eclipse of an attractive model's features.

Altogether, the Group could be congratulated on having done creditably in difficult conditions.

ORIAL GROUP EXHIBITION, JUNE, 1943 : CATALOGUE

... Mrs. R. Maingot, F.R.P.S.
erry ... J. B. Stansfield, A.R.P.S.
o Spring ... R. M. White, A.R.P.S.
the Alps ... A. E. Gnaegi, A.R.P.S.
t of Praise ... Cecil J. Blay, A.R.P.S.
erine's Lighthouse
Dr. S. D. Jouhar, F.R.P.S.
A Girl ... G. Newby, F.R.P.S.
ck Vale ... F. Hall, A.R.P.S.
... Rev. Egerton Ryerson, A.R.P.S.
hoir, Ely H. T. Winterhalder, A.R.P.S.
ado ... J. S. Feuchtbaum
Pair of Sparkling Eyes
G. Scott Bushe, F.R.P.S.
Polish ... F. H. Sharman, A.R.P.S.

14 Orpheus and Eurydice J. T. Knight, A.R.P.S.
15 Lieut. Brown ... Miss C. E. Shield, A.R.P.S.
16 The Ginger Jar ... F. Hall, A.R.P.S.
17 Children's Corner ... J. Rule Thomas, A.R.P.S.
18 Second to None ... Leslie Chapman, A.R.P.S.
19 Folies Bergeres ... F. H. Sharman, A.R.P.S.
20 Yesterday ... David Owen, A.R.P.S.
21 Jack and Jill ... Rev. George Allan, A.R.P.S.
22 Enslaved ... Dr. S. D. Jouhar, F.R.P.S.
23 Wendover Church Porch
Rev. Egerton Ryerson, A.R.P.S.
24 Act II Adjustments ... P. J. Mullett
25 Umbrella Girl ... R. M. White, A.R.P.S.
26 "Is It Nothing to You?"
F. W. Ferguson, A.R.P.S.



Rev. Egerton Ryerson, A.R.P.S.



The Ginger Jar

F. Hall



Sigüenza. The Cathedral, from the South

J. R. H. Weaver, M.A.

SPANISH ARCHITECTURE

This Exhibition has attracted much interest and has been greatly appreciated by Members and visitors. As a result of the postponement of the Exhibition of Colour Photographs which was to have followed it we are happy to announce that it will remain on view until the end of the present month.

In an introductory note to the catalogue of the Exhibition, Mr. J. R. H. Weaver writes: "These photographs, part of a much larger collection, were taken at various times between 1913 and 1931. They are contact prints from original negatives, in Platinotype and Palladiotype processes, alas, no longer available. They were inspired originally by a desire to supplement photographically the drawings of George Edmund Street in his "Gothic Architecture in Spain" (1865), a work which, if out of date by later investigators, will ever remain a classic to English readers for its revelation of the architectural splendours of mediæval Spain.

Later motives supervened—historical and æsthetic—the illustration of features of new interest, the recording of detail unlikely to survive a tempestuous age and the rendering of that interior effect which it was the special aim of early Spanish builders to create. Underlying it all has been the desire to preserve for photography the field in which, above all others, its own peculiar technique, however old-fashioned (and maybe the better so), can make it of enduring value."

TO the average club member of to-day the name of J. R. H. Weaver probably conveys little, but to those of a generation back it was familiar as one of the most accomplished and sensitive of photographers specialising in architectural subjects, and particularly as the recorder and interpreter of the cathedrals and other ecclesiastical buildings of Spain. It was, therefore, a great joy to see again the collection of fifty-two of his finest prints, which were displayed in the Society's house during June.

Few people, and certainly few photographers, have travelled in Spain since the Spanish Civil War, and therefore there is not much known regarding the destruction wrought on her beautiful old churches and other historic buildings. That much damage was done is common know-

ledge, and for that reason these beautiful records of J. R. H. Weaver's have a double value. It may not be much consolation to have merely a record when the thing itself has perished beyond recall, but this series of photographs will undoubtedly serve to show future generations what they have lost, for they preserve not only the details but the very spirit of these superb Gothic buildings.

These photographs, moreover, bring home to us, what we have lost by war in the shape of the Platinotype printing process, at once the most permanent and most beautiful of all the methods of producing photographs. Mr. Weaver was an unrivalled master in the handling of the process.

J. DUDLEY JOHNSTON.

SOME APPLICATIONS OF HIGH-SPEED PHOTOGRAPHY

By E. D. Eyles, B.Sc., F.Inst.P., F.R.P.S.

A meeting of The Royal Photographic Society, arranged in conjunction with the Association of Scientific Workers, was held at the Society's House, 16, Prince's Gate, S.W.7, on Friday, November 1942, with Mr. E. R. DAVIES, B.Sc., F.Inst.P., F.R.P.S., in the chair. Mr. E. D. EYLES, B.Sc., F.Inst.P., F.R.P.S., gave a talk on "Some Applications of High-Speed Photography," illustrated by slides and films. High-speed photographic apparatus was on view.

The CHAIRMAN, in introducing the lecturer, said that Mr. Eyles was his colleague, and, as a member of the Kodak Research Laboratories, had had a wide and varied experience of physical research. In the course of this work, he had come into contact with problems of high-speed photography, and published an account of the subject, which was not only authoritative, but contained one of the most extensive bibliographies on the subject.*

It was characteristic of Mr. Eyles that shortly after the outbreak of war he realised the importance of high-speed photography, and took up with enthusiasm a number of problems to which high-speed photography had provided the solution. It was no accident that he had gathered around him helpers as enthusiastic as himself, and they had, by means of their work, contributed materially to the war effort.

Mr. EYLES said: There is nothing fundamentally new about high-speed photography. Photographs were taken with short exposure times by a number of persons as far back as the 1870's and 1880's, even before the introduction of the dry plate. Some of no doubt, are familiar with the work of Muybridge and the zoopraxiscope, who took excellent high-speed shadow pictures of movements of the wings of birds and the legs of animals. For spring-actuated mechanical shutters, the exposure time of between 1/800th and 1/1000th sec., used by those persons, was short, even for these.

Marey actually got down to exposure times as short as 1/25,000th sec. by means of a shutter which consisted of a pair of slotted discs rotating in opposite directions. However, a number of advances in technique have been made in the last years, and I propose, first of all, to describe some of the more important of these.

A single high-speed photograph can be obtained at any pre-determined instant in the course of some event by the synchronisation of the exposure with the action. Such synchronisation can be effected if it is part of the moving mechanism

to be studied is arranged to release the camera shutter at the required instant through some mechanical or electrical coupling between the two. You are all familiar with the spark photograph of a flying bullet. That shown in the slide was taken some ten years ago by Quayle, of the Bureau of Standards (Washington, D.C.), who has done an immense amount of work on projectile photography.

For this type of work the flash from an electric spark is used instead of a mechanical shutter, the time of exposure of which is not sufficiently short. With a properly designed circuit, times of exposure as short as one millionth of a second can be obtained in this way. The bullet is fired between the spark gap and the photographic plate, and at a pre-determined instant the spark is discharged from a condenser across the gap to give a sharp shadow photograph of the bullet on the plate. Quayle used a microphone operated by the noise of the explosion of the propellant and connected through a relay circuit to synchronise the spark discharge with that of the bullet from the firearm. Before the introduction of the microphone, Sir Charles Boys had arranged for the bullet to break a thin wire in its flight to achieve synchronisation. The spark forms a bright light source of very small dimensions, so that small variations in the refractive index of the air also cast sharp shadows on the plate. These are set up as a result of pressure waves produced by the passage of the

bullet through the air at high speed. You will note the strong spherical wave round the muzzle of the firearm produced by the expulsion of the propellant gases, also the waves at the nose and tail of the bullet and the smaller disturbances in its wake, caused as a result of frictional heating of the air as the bullet passes through it.

A recent development in single-flash photography is the introduction of the two-electrode gaseous discharge tube. This has been largely developed by Dr. Edgerton and his co-workers in America. The modern version of this tube contains a mixture of rare gases at reduced pressure. The electrodes are connected across a large condenser which is charged up to about 2,000 volts through a transformer and rectifier. The pressure of the gas in the tube is so arranged that its sparking potential is always above that of the condenser. By means of an auxiliary electrode a high frequency pulse is sent through the tube, causing ionisation of the gas and its breakdown, accompanied by a vivid flash of light of short duration. The pulse is controlled through a trigger circuit containing a Strobotron valve.

The "Kodatron" Speedlamp (Fig. 1) is a commercial form of gaseous discharge lamp equipment, and it is mobile and very convenient. The discharge lamp is in the form of a long glass tube wound into a helix. Up the middle of the helix is mounted a small tubular projection lamp, which is used for modelling purposes.

* E. D. Eyles: "High Speed Photography and its Application to Industrial Problems." *Instruments*, 18, Sept., 1941, pp 175-184; *trans. in J. Brit. Kinematographic Soc.*, 5, 1942, pp. 2-15.



Fig. 1—Kodatron Speedlamp

Both the discharge tube and the projection lamp are easily demountable from the moulded plastic four-pin base, and in cases of failure, either may be easily replaced. A frosted glass envelope fitting into the base encloses the lamp and tube.

The effective time of exposure given by a gaseous discharge lamp depends upon the condenser capacity, the effective time of exposure and the total light flux increasing as the capacity is increased up to the point where breakdown of the walls of the tube would occur. By varying the capacity in this way, exposure times from about 10 to 200 microseconds can be obtained. An exposure time of 30 microseconds (1/30,000th second) has been found to be most generally useful. At an effective exposure time of 200 microseconds, the light flux is such that a subject some 250 feet square at 250 feet distant from the light source can be illuminated sufficiently well to enable a photograph to be taken on modern high-speed panchromatic films or plate with an f 2 lens. It has been estimated that under these conditions the candle-power within the angle of the reflector is of the order of 50 millions.

A development of the gaseous discharge tube is the special form of X-ray tube which is also designed to operate from a condenser discharge giving X-ray exposures of a few microseconds' duration. By such means, it is possible to gain informa-

tion of what is going on inside the subject during the course of its high-speed action. The possibilities of this are obvious.

The synchronised single-flash photograph, as I have previously mentioned, enables a record of a rapid phenomenon to be obtained at any pre-arranged instant. The introduction of the microphone and photo-electric cell have simplified accurate synchronisation of the picture-taking with the action. However, in order to obtain a complete record of the progress of any phenomenon throughout its duration, a whole series of photographs must be taken at timed intervals throughout the action. It is possible to-day to take photographs at the rate of 3,000 or more in a second. If these are taken on sub-standard 16 mm. film, which is normally projected at 16 pictures per second, an effective "time magnification" of 200 is obtained, that is, the action is slowed up some 200 times.

A convenient method of obtaining such a series of pictures is by an extension of the gaseous discharge lamp system, in which the lamp is flashed at high frequency by means of a commutator on the film driving shaft of the camera, which drives motion picture film continuously past the lens at its focal plane. This continuous motion of the film is necessary at taking frequencies above about 300 pictures per second, because the mechanical strain imposed upon the film perforations caused by continually stopping and starting it, as in intermittent motion picture cameras of the conventional type, is high and the film would be damaged. That intermittent motion cameras have been made to run as fast as 300 frames per second is, in itself, a great engineering achievement and says much for the accuracy of the workmanship, both in making such cameras and perforating the film.

For motion picture work of this sort, using continuously moving film and an intermittent light source, the effective time of exposure of the flash must be short enough to prevent degradation of the image due to movement of the film itself during the exposure. Thus at frequencies as high as 2,000 pictures per second on standard 35 mm. or sub-standard 16 mm. film, exposure times of the order of only a few microseconds can be tolerated. This inevitably means a limited amount of light from the flash as the condenser capacity must be kept small to keep the effective time of exposure down. Thus, with this system, at high frequencies, only subject of limited size can be photographed.

An alternative method, which has

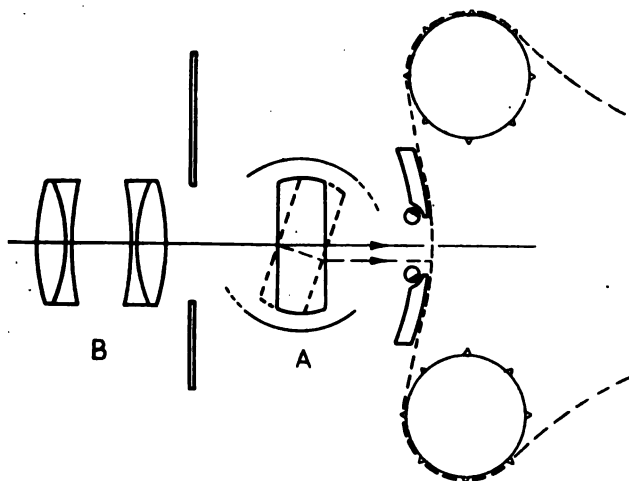
proved very satisfactory is to use a continuous light source and a mechanical shutter fitted to the camera, through which the subject moves continuously as the taking frequency is high. To keep the lighting required reasonable limits, the exposure is maintained as long as is consistent with the stoppage of motion of the subject to be photographed. This can only be achieved by the introduction of some optical compensation for compensating for the movement of the film in the focal plane during the time the shutter is open, to reduce the relative motion of the subject and film to zero.

A number of methods for such optical compensation have been suggested, in which a whole series of lenses spaced round the periphery of a large rotating flat disc are brought into position in turn to focus on the moving film, thus moving the image along at the same rate as the film is moved to compensate for definition.

Another method consists in using a rectangular glass block between the lens and the moving film, the optical thickness of the block being held in a cylindrical mount which acts as a barrel-type shutter, and its rotation is so adjusted that when the shutter is open, the image plane of the film is displaced at the same speed and in the same direction as the latter, thus giving the compensation. This optical compensation is shown diagrammatically in Fig. 2. The advantage of this system, which is used on the Kodak high-speed cameras, is that the optical compensation is simpler and smaller, and requires considerably less drive than that given by the rotating disc system, because the image is laterally displaced. It is simpler and smaller, and requires considerably less drive.

There are two such cameras manufactured by the Eastman Company, and designed for sub-standard 16 mm. film, as examples of them both here. The first is designed to run at 2,000 pictures per second. This is achieved by a governed motor which stops and starts at will the passage of the film by means of a combined switch and friction clutch. The camera has a magazine for 200 feet of film.

The second, or ultra-high-speed camera, can take pictures at a frequency of about 3,000 per second. The model shown here is of the type as the camera has been completely re-designed, and an improved model will be available in the United States by



Schematic diagram of the optical system of a non-intermittent cine camera with optical compensation

the basic principles of the identical. The speed is the use of a series motor considerably over-volted. is started on a series some of which is gradually until the film is up to speed. no sudden jerk is applied which would tear the s. It is possible to the film up to maximum the first 40 feet, that is, at 20 per cent of the 200 which the magazine is built

At such a high rate of it is, of course, impossible e film, which must run completion once it has he camera is fitted with an 1½ inch focal length.

to time the sequence of e camera was originally work in conjunction with ing gear designed by the Electric Co., Ltd. This enables a clock dial, a synchronous motor by a tuning fork, to be ed at the side of each picture. The camera you not fitted with this rather ming gear, but a time base l, using a much simpler it. A 1,000-cycle contact-tuning fork is provided

rs on the extremities of Fine slits are cut in the ad these are arranged to high intensity beam of rough a simple optical image of the slit is thrown lge of the film as it passes e camera gate to give a ort dashes along the edge at one-thousandth second

At 3,000 pictures per second, the exposure time given by this camera is about one ten-thousandth of a second. This frequency and exposure time has proved in practice to be adequate to deal with most of the subjects likely to be met with in industrial work for analysing the movement of machine parts and numerous other purposes.

Even with the maximum lens aperture of $f/2$ and modern high-speed panchromatic films, a considerable amount of illumination is required to obtain properly exposed negatives. We have found over-run tungsten lamps of the Photoflood variety, in properly designed reflectors, to be very convenient and satisfactory, and also spotlights with properly designed optical systems to concentrate the light from 2 and 5 kilowatt tungsten projector lamps. For average subjects, up to 10 feet square, as much as 20 kilowatts may be required for lighting of this type. The advent of the compact source high-pressure mercury vapour tube, with its convenience and extremely high photographic efficiency, will undoubtedly prove of great value in this type of work. It is already showing its value in conjunction with optical systems of special type, one of which I shall describe later.

There are various ways of getting over lighting difficulties which can be used for high-speed photography. It should be remembered that, in general, for analytical purposes a record of pictorial quality is not required, but what is wanted is a record of the behaviour of the various moving parts in which interest is centred. One method is to "pin-point" such members by fixing small

lamps to them and to photograph the bright filaments of the lamps themselves. The surface brightness of these filaments is very high, and they trace out the motion of the member to which they are attached. I think that I can best illustrate other optical methods of solving the lighting difficulty by describing two specific examples with which we have been called upon to deal in the course of our work in the industrial field.

One of the problems we were called upon to solve was to determine how much the anvil of a heavy drop forging hammer moved under the impact of a blow from the hammer, as some trouble had been experienced with the foundations. We were told that the job had to be carried through quickly to avoid disturbing production. This, in particular in these days, is a condition attending most jobs of this type, so that we were not particularly disturbed by it. The hammer weighed some 20,000 lbs. and was forced down by a steam-driven piston. The effect of the blow to the uninitiated observer was rather awe inspiring. The whole area for a considerable distance around the hammer was thrown into violent vibration, and the smoke and flame was ejected in sufficient quantity partially to obliterate the anvil, as a result of combustion of the fluxes used in the forging process. Visual estimates of the anvil movement varied between one quarter of an inch and two inches. It was quite obvious at once that straightforward lighting would not do, in fact it had previously been tried and failed to yield any result. In the first place, therefore, sufficient light had to be obtained at the point upon which interest was centred, and, secondly, some means had to be found to provide a fixed reference point in space, undisturbed by the effects of the blow, from which measurements could be made. This was essential, as the camera itself had to be close to the anvil and would be violently disturbed at the critical moment.

For illumination, a simple optical system was used. A right-angled prism and a lens of suitable focal length placed over its face opposite the right-angle were mounted into a heavy metal holder which was fitted with a plug designed to fix it into a blind hole in the side of the anvil. The hole in the anvil had been provided to facilitate lifting. The prism-lens unit is shown in Fig. 3 (a). The light from a single Photoflood lamp placed just behind and above the camera was reflected back through the prism into the camera lens, the lens at the prism face forming an image of the lamp bulb at the

error M. From there, the light is reflected back to the surface of the mirror, and hence it is reflected back on its path into the camera. The camera lens is focused on the mirror M, forming an image of the mirror on the film F at its focal distance. In this way an extended field of illumination of high brightness is produced. The brightness of the field is proportional to that of the surface of the mirror, apart from transmission losses in the optical system, which is negligible. When it is considered that the brightness of the 500-watt source high-pressure sodium tube is as much as that of the surface brightness of the sun itself, the magnitude of illumination obtained in this way is appreciated. If the photograph is operated in the large mirror, high-speed photographs of its performance can easily be taken, the spray appears as a dense black shadow against an intensely bright back-

ground. A point of interest about the method described above, is that, by using a diaphragm S_1 (Fig. 4) placed at the centre of curvature of the mirror, an image of it is formed at the point by reflexion in the mirror M. If the knife edge is moved properly, it can be made to move in a parallel slit with its focus, producing effectively a source of light at the centre of curvature of the mirror. This 'Schlieren' system of illumination enables small differences in refractive index of the air or in the density of the media to be made apparent, and effects similar to those in the first slide of the series can be obtained. By using this evaporation phenomena can be observed in a microscopical aspect of the spray, and now let us consider the microscopic aspect, that is, the photography of the individual droplets in the spray in motion. In order to adopt a system of illumination, this time a small lens, the dimensions of which are small enough to make the work entailed an economic proposition. The photographic camera used was a two-inch focus camera lens. The diameter of some thirty droplets obtained by using a cylindrical air duct some 1/2 inch in length at the further end of a dark slide carrying the photographic plate was placed. The gain in speed operated in front of the mirror, this time illuminated

arise in practice, and which can only be devised from considerations of the geometry of the system. It is by means of a bright spark arranged to give a flash of light of high brightness for a duration of about 1/20,000th of a second. In this way, sharp photographs of the individual droplets were obtained in any section of the spray selected by means of a suitable diaphragm. A typical example is shown in the enlargement, Fig. 5. From such pictures, measurements of the drop diameters were made, and hence the drop-size distribution determined for various types of nozzles. By arranging two successive flashes from the spark at a known short interval apart, the rate of travel of each drop could be readily determined.

These two actual examples will give you some idea of what can be accomplished by a combination of optics and photography to overcome illumination difficulties which often

physical conditions of each individual problem.

Finally, I should like to have projected three short films to illustrate some of the points I have mentioned, and to bring to your attention still further possibilities.

Three films were then projected. The first was of general interest and showed examples of apparatus and photographs taken by various techniques. The second film demonstrated how transient stresses in engineering parts could be examined by a combination of high-speed photography and photo-elastic stress analysis using birefringent plastics. The third film, made and exhibited by Mr. Newberry, of the L.M.S. Laboratories, demonstrated a novel method for simplifying the analysis of high-speed photographic records of the behaviour of the wheels of rolling stock on rails of different designs.

In answer to a question as to the gas used in the "Kodatron" tube, Mr. EYLES replied that it was a mixture of Krypton and Xenon. Another questioner asked if multi-flash work could be carried out with a "Kodatron," and he replied that due to the fact that a large condenser pack was used with a "Kodatron," it could not be flashed at intervals of less than ten seconds, but if a smaller flash was used, it could be flashed at much higher frequency. The trigger control was entirely electrical.

The CHAIRMAN proposed a very hearty vote of thanks to Mr Eyles (which was carried by applause) for his most interesting lecture. In acknowledging the vote, Mr. EYLES wished to place on record his appreciation of the work of his assistants, particularly Mr. Stewart, who was present at the lecture.

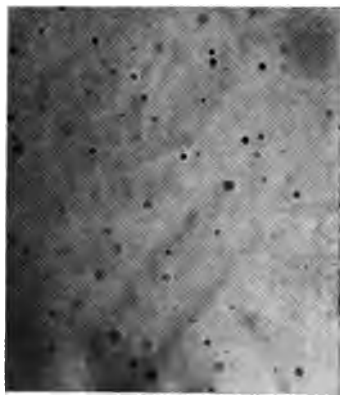


Fig. 5—High-speed photomicrograph for drop size distribution measurement of spray

THE ALFRED WATKINS MEMORIAL LECTURES

The Hereford Photographic Society has instituted two special annual lectures, to be known as "The Alfred Watkins Memorial Lectures."

The achievements of the late Alfred Watkins in the realm of photography are well known and universally recognised. It is sufficient to recall his work on exposure and development, for which the Royal Photographic Society honoured him with the award of their Progress Medal in 1910.

The Memorial Lectures are designed to keep green the memory of Alfred Watkins and his contemporary workers, and to encourage still further the development of photography in every sphere.

The Lectures will be of the highest standard, and invitations to Mr. D.

McMaster, F.R.P.S., and Mr. F. J. Mortimer, C.B.E., Hon. F.R.P.S., F.R.S.A., to deliver the first two inaugural lectures were readily accepted. Mr. Mortimer will give the first lecture at the Hereford Town Hall on July 22nd, at 7 p.m., and Mr. McMaster the second on October 14th, at 7 p.m. Mr. Mortimer will speak on "Photography's Part in the War," and will include the latest developments up to July. Mr. McMaster's subject will be announced at a later date.

Members of the R.P.S. and of the Affiliated Societies, with their friends, will be warmly welcomed, and are invited to obtain invitation cards from Mr. A. Royden Willetts, A.R.P.S., Hon. Sec., Alfred Watkins Memorial Lectures, 19, Widemarsh Street, Hereford.

SIMPLE OPTICS OF PHOTOGRAPHIC LENS

By E. W. H. Selwyn, A.R.C.S., B.Sc., F.Inst.P., F.R.P.S.

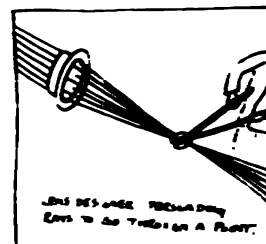
MR. E. W. H. SELWYN, following the Annual General Meeting of the Scientific and Technical Group of The Royal Photographic Society, at 16, Prince's Gate, S.W.7, on March 30th, with Mr. F. J. Tritton, B.Sc., F.I.C., F.R.P.S., in the chair, gave a brief and elementary talk on this subject and illustrated it with some amusing lantern slides whereby the laws of optics were brought home in an unusual way.

He explained first how it was that the greater thickness of glass in the middle of the photographic objective

the image focused very carefully on the ground glass. The position of the image is called the rear principal focus. The lens is then turned back to front and the image again focused carefully. This new position with respect to the lens is then called the front principal focus. The camera is again set up with the lens in the right direction and pointed at an object of known size. The ratio of the size of the in-focus image to the size of the object is then multiplied by the distance of the object from the front principal focus, and this is called the focal length of the lens. The rule is then that the distance between any object and the front principal focus is the focal length divided by the magnification, while the distance of the focused image from the rear principal focus is the focal length multiplied by the magnification. This rule is easier to remember and

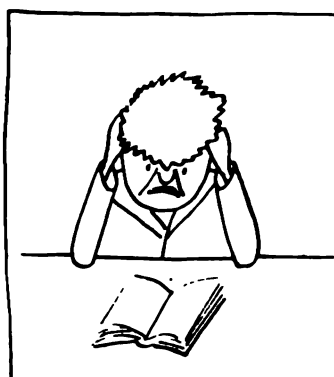
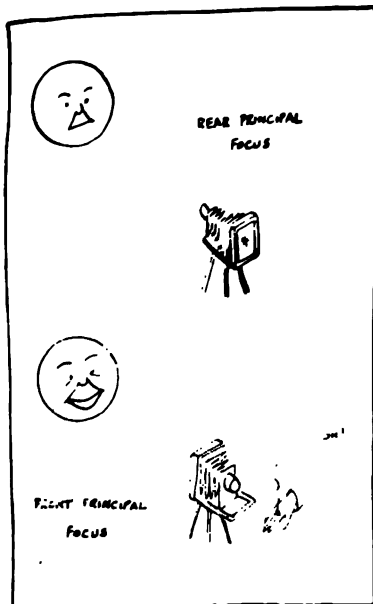
sharp definition, the pinhole distortion, and therefore made wide-angle lens, but exposure lengthy.

He did not think that practical photographer it was while paying overmuch attention to aberrations. They were, of of paramount importance designers, whose object was them all disappear so that



and the slower speed of light in glass than in air gave the lens its capacity to form an image, and then proceeded to deal with the problem of calculating the position of the image of a given object. The calculation is based on three experimental observations made as follows. The camera is first pointed at a very distant object, such as the sun, and

through the lens converged to focus. Perhaps the photographer might pay some attention to this, which could be a nuisance for architectural subjects. But other aberrations, even if an aberration was of small amount except that when using infra-red some small correction to the focus might be necessary, when the lens designer had succeeded in removing all aberrations, the image of a point source was not a point but a small disc surrounded by dark rings, the size of which was greater the more the lens was stopped down. This was due to diffraction.



$$1/v - 1/u = 1/f$$

use in practice than the usual "thin lens" formula.

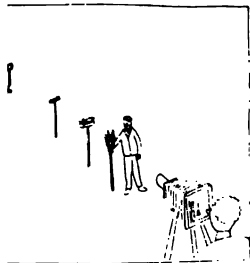
In making optical calculations, rays rather than waves were used, a ray of light being best considered as the path travelled by a small section of a wave. The best example of a ray was afforded by the pinhole camera. Although it did not give



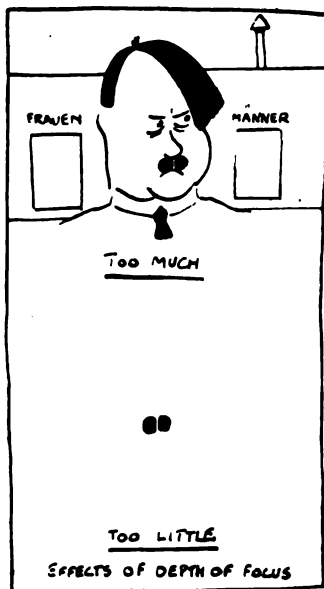
This had a curious result change of sharpness on stopping down. At the maximum aperture photographic objectives have considerable aberrations, but on stopping down the aberrations were somewhat because some of which missed the focus were. Thus, at the commencement of stopping down, the sharpness of the photograph increased, but on stopping down still more, the lens became nearly perfect as regards aberrations and then the diffraction effect became important, and further stopping down decreased the sharpness.

sharpness usually became at about $f/22$.

Mr. Selwyn suggested that the depth of field and depth of focus should be best considered from the optical point of view and the following hypothetical experiment. Set up a camera and focus on an object at a very great distance, that is at infinity for practical purposes. Then change the lens so that this object



sharp, and get an assistant to move the object so that with the new position its image was sharp. Then put this image just not in focus. In place another object lens, so that its image was sharp. Proceed in the same way with the next object was as near as possible to the lens. Then it was found that the intervals between successive positions of the object were all about the same, while the object became closer and closer to the lens. The nearer they were to the lens, the more the formula for depth of field was very simply obtained from the formula. The influence of the focal length of the lens on depth of field is quite easily seen from



purely geometrical considerations. It was important to realise that too great a depth of field could be just as much a disadvantage as too little.

The focal length and angle of view had an important effect on the apparent perspective of the photograph. If the print was made by contact, the proper viewing distance was equal to the focal length of the lens, and might require a magnifying lens to enable the eye to view the picture sharply. If the perspective of a print appeared wrong, it could always be put right by viewing at the correct distance.



In reply to Mr. S. REAL, Mr. Selwyn said that the change in sharpness depended upon the lens itself, on whether the subject was of high or low contrast, and also upon the nature of the film. As a rough general rule, he would say that if the lens had a maximum aperture of f/x , the sharpest results would be obtained round about $f/2x$. One must also take into account the fact that the sharpness would change differently in different parts of the picture. To get depth of field, it might be necessary to go below $f/16$, which he thought was about as far as it was necessary to go to get maximum sharpness with modern lenses.

The CHAIRMAN, in thanking Mr. Selwyn for his talk, said that he had shown how to mix the malt with the cod liver oil in photographic optics.

PLANNING OF SCIENCE

g of Science. Proceeding conference held in London direction of Scientific Work-shed by the Association, House, High Holborn, ce 2s. 6d:

is a word of popularity these days, whether it is more than a word depends who plan. This 127-page the conference held in of vital interest to every worker, and to the vastly public who are only beginning how closely science impacts their daily life, and to their future is bound up in development of science.

The conference directed its energies to three main themes: The central direction of science; local organisation; and determining the future. It cannot be too strongly emphasised that the Association of Scientific Workers, with its membership of over 12,000, is a Trade Union. The fact that scientific men of the calibre of Sir Robert Watson Watt (the President), Sir F. Gowland Hopkins, Sir Richard Gregory, Professors J. B. S. Haldane, J. D. Bernal, P. M. S. Blackett, Winifred Cullis, Julian Huxley and many others are officers of the Association, and that Sir Stafford Cripps, Air Chief Marshal Sir Philip Joubert and Sir Lawrence Bragg addressed the conference in-

dicates the extent to which scientific workers realise their responsibilities to themselves and to their fellow citizens, and the necessity of solidarity with workers in other fields. That this is so may be news to many. It is significant news, and the whole proceedings of the conference provide a most valuable and enlightened commentary on the understanding of British Science, and particularly the younger scientific workers, as to the advantage and the necessity for planning. The volume is indeed, as the President writes in his introduction, "a volume of measured and balanced thought, of reasoned moderation, and constructive suggestion."

H. W. GREENWOOD.

SEPARATION NEGATIVES FROM DUFAYCOLOR TRANSPARENCIES

By C. H. Beale, B.Sc., A.I.C., F.R.P.S., and A. Cornwell-Clyne, M.B.E., F.R.P.S.

At a meeting arranged by the Colour Group of the The Royal Photographic Society, held 16, Prince's Gate, S.W.7, on February 6th, 1943, with Mr. F. J. Tritton, B.Sc., F.I.C., F.R.P.S. in the chair, a paper by Mr. C. H. Beale and Major A. Cornwell-Clyne was read by Mr. Beale.

The Chairman, in introducing the authors, said that the subject of colour separation negatives was one of particular and active interest to members of the Colour Group. It was not a new subject, but it was one on which there was a great deal to be said. New methods and new techniques were being developed all the time with obvious improvements in results. When accumulated knowledge of the last few years became available there would be quite appreciable effects. In the meantime, Major Clyne and Mr. Beale had been working on this subject, the paper on "Separation Negatives from Dufaycolor Transparencies" described some of the improvements in methods.

THE scope of this paper is defined by the title in that it does not deal with all problems connected with making of separation negatives, but only with those specific to Dufaycolor and which arise as a direct result of working from Dufaycolor originals. Hence it omits reference to such questions as contrast of plates and the vexed question of development conditions and their effect on evenness and on reproducibility of results.

Separation negatives can be prepared very easily from Dufaycolor transparencies by means of a straightforward technique. Most of the operations are similar to the ones involved in the ordinary methods of preparing separation negatives.

There are two ways of making separation negatives from a transparency: 1. by contact; 2. by projection, in which case negatives of greater or smaller size may be made.

Dufaycolor research is too well known to need detailed description, but briefly, it consists of adjacent areas of red, green and blue and the combined effect in the eye of these areas with varying silver densities behind them gives the coloured picture. In the transparency the colours of the subject have already been split up into three parts, viz. the part behind the red squares, that behind the green and that behind the blue. These three parts are intermingled and it is our purpose to separate one from another by means of three filters. The filters generally used for making separation negatives in the camera direct from the subject are the well-known Wratten or Wratten and Wratten sets, which, though not identical, are very similar. We might expect that we could select in the three records of the Dufaycolor transparency if the exposures were made through these filters successively first through the red on to one plate, then the green on to another, and so on. Difficulty is experienced, however, in that the results obtained are very degraded or lacking in brilliance of colour. This is due to the fact that the coloured elements in Dufaycolor are common with all other screen plate processes, have to have common transmission bands, e.g. the red transmits not only red light, but also orange and yellow, while the green transmits not only green, but also yellow-green and yellow. If then the analysis filter used for making the separation negatives itself transmits light which is

common to both elements we shall not get separation, since not only will light pass through a record of the colour required, but light would also pass through one of the other sets of elements and it would, of course, be unwanted and so cause the trouble which we have noted. This is the crux of the problem and a large part of what we have to do with this point. It would be possible to make a Dufaycolor in which the transmissions of the three elements would be quite separate from each other, such a film, though very good from the point of view of making separation negatives, would be far too difficult to use for any other purpose. Therefore, owing to the fact that these "overlaps" in transmission are fairly large, it is not easy to get perfect separation of one record from another.

By making the spectrum range of each of the filters as narrow as possible, separation may be improved. Such a set of filters has been specially worked out for use in the camera for the narrow element transmission, and known as the Narrow Cut Red, Green and Blue (Nos. 523, 524 and 525 respectively).

This point was demonstrated on the screen in two ways. First, of flat colour, red and green on a slide showed the common yellow transmission, while green overlapped showed the common blue-green. Crossing horizontal strips of Standard Tricolor Green and Blue with vertical strips of the thin flat red, the proportions of wanted and unwanted were plainly visible. A similar slide in which Standard Tricolor filters were replaced by the Narrow Cut set showed that there was little unwanted present. Attempts to make the filter bands narrower resulted in very inefficient filters owing to the fact that not only is the unwanted light reduced, transmission by the filter of a wanted light is also reduced as well, giving excessively high filter factors and consequently long exposures. The Narrow Cut Red, Green and Blue filters represent the best separation it is possible to obtain by ordinary incoherent artificial light or daylight.

By other means, however, it is possible to improve further on these results. The ideal filter is obviously extremely narrow band, so narrow as to be called

light. Though we cannot realise this in an incandescent light and gelatine filters, let it happen when monochromatic light from a source is used.

In this, one modification in procedure must be made. So far we have dealt with the "flat" réseau; owing to certain factors associated with manufacture of réseau, it is not possible to obtain colours which are known to be identical in appearance with the microscopic elements. Since it is of high practical interest as they are the Dufaycolor réseau, a different method must be used for accurate comparison between the effects of filters. Though the rougher method does demonstrate the differences in the earlier paper, it may be mentioned that the more accurate method was used, of course, in working out the transmissions for Narrow Cut filters.

This consists in making black and white photographs using the chosen light sources, with "typical" results as would be used in making separation negatives. On each plate the réseau elements then consist of rectangular areas of three different densities of silver. These three densities are compared with a wedge printed on the same plate at the same time; whence it is possible to calculate the separation for any given filter. In terms of the 100 Red 0 Green 0 Blue would be perfect for the red record, while 33 Red 33 Green 33 would be no separation at all. A separate plate is used for every filter or light in which one is interested. Thus, using monochromatic light from a number of regions throughout the spectrum, and by this means were selected the best results for separation.

A kindred problem, viz, the printing of separation on Dufaycolor in order to make copies, is done either by the negative-positive method as described by Morrison and Horner, and reported by them in *Phot. J.*, p. 320. The mathematical treatment deals with an earlier form of Dufaycolor. It is to that work considerable improvements in the transmission of Dufaycolor elements have been made (*Phot. J.*, 1941, p. 351).

A microscope or monochromator is a very unwieldy apparatus for making separation negatives—it is expensive, and normally produces only a small amount of useful light. It is therefore not suitable for other than laboratory work. There are, however, namely, certain electric discharge lamps which are "line sources." In pre-war days some of the commonest were the yellow (sodium) and blue-violet (mercury) lamps used for lighting arterial roads. These are extremely useful for making separation negatives on Dufaycolor. Apart from the slight disadvantage of comparatively high initial cost, they have a long life, fairly low temperature in lamp, and give the desired light. (In order that one might see these lamps in operation, examples of the types of lamps detailed below, together with their attendant resistances or chokes, were demon-

strated, without cadmium addition, but in this case the red exposure must be made by means of an ordinary half-watt light with Narrow Cut Red filter. This is a compromise, but, nevertheless, it is a good compromise.

The five main types of lamp shown are as follows: (1) Small 60-watt laboratory type—which is used in a small printer for stills up to quarter-plate size; (2) 80 or 125-watt type with smaller and brighter source; (3) Street-lighting type—400 watts, obtainable as mercury or mercury cadmium; (4) Special type of mercury cadmium lamp manufactured in U.S.A. and known as G.E.C. Type II lamp. This is very satisfactory, but until the war is over any further supplies are unobtainable in this country; (5) Finally, as a point of interest, is shown a lamp of extremely high brilliance which is somewhat experimental, but is likely to be of importance after the war. These lamps are likely to be obtainable in wattages of 250 or 500, or even 1,000. The actual length of the discharge is only about a quarter of an inch, and it is less than that in diameter.

All these lamps need either a choke or resistance in circuit, but with this they may be plugged into the ordinary mains supply. The life of these high-pressure mercury vapour (h.p.m.v.)* lamps is very long and is comparable with that of ordinary general lighting service lamps. When they are used the procedure for making the exposure is slightly different from normal, in that one has to use a lamphouse (which, incidentally, is advisable in any case to protect the eyes from glare), and to make the exposure by means of a shutter or a card put in and out of the beam. This is necessary for two reasons, firstly, the lamp emission changes considerably during a warming-up period of some minutes, and, secondly, once the lamp has been switched off it will not relight for some minutes until it has cooled below a certain temperature.

This, then, completes the story as far as the best possible light source is concerned. Recapitulating, we have seen that with half-watt light Narrow Cut filters must be used and these give far better results than do the Standard Tricolour sets, and that further improvements are obtainable by using mercury lamps (in conjunction with half-watt for the red separation negative), or, better still, by using suitably filtered mercury cadmium lamp.

As to the choice of lamp which any individual user may make—the following factors must be weighed up: the cost of initial outlay, the amount of printing to be done, and the standard of reproduction, i.e., whether absolutely the highest quality is required or whether something good, but not the best, will be satisfactory.

The techniques which have been found most satisfactory for the preparation of negatives will now be described. For making contact separation negatives a 400-watt street-lighting type mercury cadmium lamp is used, enclosed in a light-tight lamphouse with an exposing shutter. Any good panchromatic plate may be used, but it should be backed. Cut film may also be used, but great care must be taken that the film, either in the dark slide (for projection), or in the printing frame (for contact), is kept absolutely flat. A certain amount of lack of flatness may be permissible in black and white work without any readily noticeable effect on definition, but in the case of separation negatives, it is much more important to keep the film flat as variations in flatness on the three negatives may result in colour fringing or a very unpleasant slight fuzziness of colour.

From another point of view also, in the case of contact printing, good contact is necessary. When a continuous tone negative or transparency is printed, any lack of

two main types, Mercury and Mercury cadmium. In the latter the well-known lines of mercury plus others due to cadmium. These cadmium lines are unwanted with the important exception of the blue line. By choosing the right filters one can obtain lines which correspond extremely well with the positions indicated by the monochromator experiments. Actually the same set of filters as for half-watt light is used. It may be that the plain mercury lamp can be used,

* NOTE: Further information on this type of lamp as made by one of the British manufacturers, is given in a recent paper by Bourne, *—Phot. J.*, April, 1943, p. 135-142.

contact will result merely in a lack of sharpness, but in the case of an additive transparency or a dot image, lack of contact will not only cause lack of sharpness, but will also cause an actual difference of density. Irregular or uneven contact will therefore result in a patchiness.

A piece of half-inch sponge rubber or quarter-inch Dunlopillo carpet underlay has been found very useful in allowing a good pressure on the frame without danger of breaking the glass. Preferably the printing frame may be a Hurter Penrose high-pressure process frame.

A sheet of matt celluloid is placed on the glass at the bottom of the press.

A cardboard cut-out frame is placed in the printing frame and the transparency laid emulsion up in the corner of the card, leaving as much margin as will be needed on the plate.

The cardboard frame is removed and on top of the transparency is laid a sheet of clean and unscratched gelatine to obviate Newton's rings. The cardboard frame is replaced, white light turned off and a plate fitted into the corner. Care must be taken that the plate does not overlap the cardboard or it will be broken when the press is shut. The plate is covered with the black paper and the blanket and the press clamped up and slid into the printing position indicated by blocks screwed to the bench. Three exposures are made thus, using the following filters: 1. Narrow Cut Red Chromex 523, plus ultra-violet absorber Chromex 509, plus Didymium glass; 2. Narrow Cut Green Chromex 524, plus ultra-violet absorber Chromex 509, plus Didymium glass; 3. Narrow Cut Blue and Violet Chromex 525 and 479, respectively, plus ultra-violet absorber Chromex 509, plus Didymium glass.

The main purpose of the Didymium glass is to cut out a very strong pair of yellow lines in the mercury spectrum; other unwanted lines which are not removed by the Didymium glass are removed by the Narrow Cut filters. These filters, incidentally, are best used as cast-on-glass filters which have been coated with a varnish layer so as to make them resistant to finger marking—such a finish is perfectly satisfactory for filters which are put in a light beam, but is not advisable for filters to be placed in front of a lens.

Exposure is decided by a visual examination of the transparency based on previous experience, and if more than one transparency is being done on one plate they should be of approximately the same density and contrast.

The procedure for separation negatives by projection is somewhat different and details are described below.

The apparatus used consists essentially of a condenser enlarger and a camera mounted together on rails to form an optical bench. The light source employed is the special American G.E.C. Type H mercury cadmium 100-watt high-pressure lamp previously referred to. A calcium glass one-sixteenth of an inch thick is fitted immediately in front of the lamphouse to absorb heat and deep red radiation. A 400-watt voltage regulator is employed to ensure uniformity of exposure.

The transparency is clipped between a pair of cut-out mounts made from chromium plated steel using plates.

The condenser used must, of course, be large enough to cover the largest transparency to be used. If it were not a small transparency is used with a larger condenser there is a serious loss of light. In the case of miniature transparencies, therefore, a shorter focal condenser should be used so the distance between condenser and transparency should be increased.

It may be noted in passing that where large transparencies have to be dealt with, the separation negatives can be prepared by photographing the illuminated transparency using a camera in the normal way. The transparency should be mounted in a vertical position

about three inches in front of a piece of ground glass which is evenly lit from the back, or, after the transparency can be supported in front of a white surface such as blotting paper which is lit from the sides or from the top and bottom. It is to mount the transparency between two glasses it flat. This is important, for, should the transparency buckle between or during exposures, the negatives will not register accurately. These glasses should be kept scrupulously clean and free from scratches. Great care should be taken to see that the transparency is locked in position to ensure that no movement occurs between the successive exposures.

Reverting to the optical system for projection, light is adjusted as follows. When the picture is focused to the required size, the transparency and glass are removed. The light is centred, looked at through the lens using a coloured filter if necessary to avoid dazzle, and the head moved from side to side until light remains stationary illumination will be correct. Otherwise the lamp or lamphouse is moved back or forwards until there is no apparent movement of light. From a photo-electric meter reading of light taken in the plane of the ground glass the exposure is calculated, the initial calibration of the apparatus having been made by trial and error.

If a neutral grey wedge can be included at the same time as the subject when the original transparency is being made, this is the ideal condition. However, it is seldom possible to do this and hence the wedge should be included on a separate transparency when making separation negatives. By inspection of this wedge, or far better, by measurement by means of a densitometer, a check can be made on the relative exposures and contrasts of the three transparencies. Unless the final printing process used is an unusual one, the three negatives will be made to the same contrast, and to ensure this, the instructions issued by the manufacturer of the plates or films used. But at this stage the only subsequent treatments are those associated with making separation negatives of all types, and it is not our purpose to deal with these in this paper, the subject may be left at this point.

Discussion

In reply to a question as to whether the narrow-cut filters mentioned were in the market, or whether they were made themselves for that work, Mr. BEALE said they were commercial filters made by Kodak Chromex Limited, and had been worked on for use in connection with the research.

Mr. DARRIN asked if they were the same filters as those some years ago, which were very dense.

Mr. BEALE said the filters Mr. Darrin referred to were in the United States. The present ones were similar but they were not so dense.

Mr. FIDELMAN asked for a definition of what was a good separation negative.

Mr. BEALE replied that this was one of those cases where a definition was impossible to give. He would suggest a definition of a good separation negative as one which could only be judged by the results of the final print. Published information on the performance of separation negatives is that it was difficult for the user to get a good result.

Mr. BEALE said that they had used a very wide range of filters.

Mr. DARRIN asked to ask Mr. Beale a question with regard to the removal of the pattern. At one time he had developed a method of removing separation negatives by making them in a camera using a small stop. As regards removing separation negatives, he was not successful, but there seemed no particular reason for this. Mr. Beale found it necessary to get a pattern.

Mr. BEALE did not think it was necessary to get rid of the pattern. One could make perfectly good prints with the pattern well defined.

A hearty vote of thanks was accorded to Mr. Beale and Mr.

LYWOOD FROM WITHIN: RELATION BETWEEN DIRECTOR AND CAMERAMAN

By Major W. Wyler and Capt. W. V. Skall

Of the United States Air Corps

NG of The Royal Photographic Society, arranged by the Cinematograph Section, 16, Prince's Gate, S.W.7, on March 20th, 1943, with the participation of Mr. D. McMaster, the Chairman of the Section. Major Wyler and Capt. Skall, two well-known personalities in the Hollywood film world. It was not for him to call to mind in this section the importance of photography; no other branch of the film industry had had so profound an effect on the customs and minds of the last twenty years. It was an international language of the best exponents of the art were to exchange, in their comments and ideas on the various spheres. Major Wyler will be remembered as the "Mrs. Miniver." He had, in fact, fled from Hollywood for a year which accompanied the award of the Academy Award for the best picture of the year.

was one of the most important Technicolor photographs of the day. They were to show Hollywood from Within, or the relationship between the Director and the Cameraman.

Major Wyler opened by saying that he had asked him what he was his subject, he had said since a Director and a Cameraman were to be on the platform, the relationship between them might be of interest, and he was able to take it in turns to "rack" at each other! He had not prepared any intended to talk about the relationship as he thought of them. Major Wyler and Capt. Skall had been together in Hollywood, now doing so over here, under very different conditions.

Major Wyler went on to say that the relationship depended on the circumstances. In the past, when rushes had been taken, they were the "rushes" merely to get the "good" or "bad" but nowadays every cameraman was a good one, although the reverse

was not necessarily true, as sometimes the cameraman would be bent on making a "pretty" picture, which might not be what the director happened to want. He recalled such an instance when he was on location in the desert making a picture, the mood of which was rather grim. To obtain this effect he was trying to get a scene of sheer desolation. The cameraman, however, was looking for some clouds to break up the completely barren scene, and to make a "pretty" picture, while he, the director, on the contrary, was looking away from the clouds because they destroyed the mood of the picture, which he wanted to be barren and bleak. The job of the cameraman was to help the director to tell the story, and a good cameraman was one who worked with the director in such harmony that they both knew what they were going to show to the people who would later see the picture. This harmony between director and cameraman was of the utmost importance, because the work of one depended so much on the work of the other. There were many elements which helped to make the complete picture, and if one failed the whole picture suffered.

Greg Toland, who would be well known to those present, was one of the most brilliant cameramen, and Major Wyler said they had made many pictures together, but in black-and-white only; he himself had never made a Technicolor picture as it was said that his pictures were expensive enough in black-and-white! (Laughter). In any case, it was his view that colour should be used only when there was a specific reason for it. He mentioned that his studio was using 16 mm. "Kodachrome" nowadays—which appeared rather like the professional turning amateur!

Going back to Greg Toland, he said that when Greg and he started a picture they planned it out together first. Directors and stars nearly always did this, but not usually director and cameraman. Greg and he would first of all consider the photography of the picture as a whole, and in these discussions they changed places—Greg was the director, and he was working under him in an advisory capacity. Another thing that Greg did when planning a film was to take

the script and analyse it photographically, and decide what style of photography was required for each section in that picture. He then, of course, harmonised all the parts together in the same way that a composer would harmonise a symphony which had different tempos and different styles. He would also take a hand in the direction of the sets and in their size. It was true that he had more freedom in this respect than many other cameramen, and his methods entitled him to be called "Director of Photography." Although many directors objected to this title, he, Major Wyler, considered it was quite appropriate if the cameraman really functioned in that capacity and actually helped to tell the story.

Some cameramen, of course, had not such freedom. Some, for instance, had a large number of pictures to turn out in a given time, and were given certain standards, by the studio, which they had to follow. Major Wyler thought that they should strike out for themselves, although it was not always easy to do so. He then went on to mention a picture of Greg Toland's called "Dead End," in which Greg lit the entire picture from behind the camera with hard arc lighting, which appeared to throw harsh sunlight flat on to the whole set and on to people's faces. This idea might not be new nowadays, but at that time it caused a sensation. Some shots were extremely hard and were not always what might be called good photography, but the effect of the picture as a whole was one of great realism. One could feel the sun beating down on the slums! One could almost smell them! It was a great contribution to the success of the picture. There had, of course, been many similar instances where the cameraman had played a big part in the success of a picture, although his contribution was not always fully recognised.

He had heard of laboratories that had criticised Greg Toland's work, but he himself admired it immensely, and was looking forward to seeing a documentary film on the bombing of Pearl Harbour, which Greg had made in Honolulu—he had written it, played in it, directed it and photographed it! Because Greg had tackled his work in his own particular way, he was fully capable of making a picture by himself. He would, for instance, concern himself just as much over an actor over-acting as would the director—perhaps more so, because he was conscious of the picture as a whole.

Major Wyler then said that "Hollywood from Within" was a theme on which he could not say very much,

as he had not been there since June. He would very much like to go back there for a while, but he knew that when he had spent a few weeks there in the sunshine and seen his family he would be very unhappy if he could not return to England or somewhere a little closer to where things were really happening.

He then asked Capt. Skell to take up the story on behalf of the cameraman.

Capt. Skell remarked that the Major had been very gracious to the cameramen, and had particularly commended the work of Greg Ireland. He would mention that Ireland was associated until he went into the Services with an organisation that was second to none. He was directly responsible to Mr. Sam Goldwyn for his photographic results, even to the point where he could contest with the director about them. He had every freedom, and as much time as he required to carry out his ideas.

But there were other types of organisation for instance where all types and lengths of picture were turned out—big ones, medium ones, little ones, travel pictures, and so on. Then there was the type of organisation like M.G.M. with whom Joe Kuttentberg worked, where the cameraman had pictures assigned to him. Then there was another type, where the cameraman was informed on Saturday afternoon that on Monday morning he would be starting a picture with Miss Sanderson, whom he had probably never even seen, and he might find her a photographic problem. Motion picture photography was primarily portrait photography, one could not always photograph things with the definition and sharpness one would wish, because the result might not be pleasing. The cameraman might for instance find that his leading lady would not like the type of lighting to be used, although she would not say a word about it, but he would not have time to look at her to know that a certain type of lighting might be necessary to show a certain part of her face, and to look at the camera and not get this bit of light, the result would be rather unsatisfactory.

Mr. Wyler then mentioned some other technical details, but he said that the cameraman should be able to handle these things. He said that the cameraman should be able to handle these things. He said that the cameraman should be able to handle these things. He said that the cameraman should be able to handle these things.

photograph a film in which the leading lady had, as he knew, a nose which was slightly bent, and also a long neck. He remembered that the leading man also had a bent nose, and he tried to remember whether both noses bent the same way or not. It was a very important matter from the cameraman's point of view. Laughter. Luckily he found that both noses were bent on the same side, so everything was all right.

Another important factor for the cameraman to bear in mind was the personality of the star which the director wished to express. For instance, Marlene Dietrich must look like the Marlene the audiences expected to see. If the cameraman got away from that personality, the director might not like it, because it was that well-known personality that he was selling to the public. If he gave her a different personality, the audience might say, 'That is not Marlene Dietrich.' Of course, if the cameraman improved the personality of an actor or a actress, and if he could persuade the director that the new personality he had produced was the preferred by the public, he might then be allowed to adopt that new technique, but it was seldom that this was possible with the well-known stars. This problem of personality was a big factor in the choice of the style of lighting to be used in any particular picture.

There were many cameramen however who had no time to think of new ideas. Some of them did six or twelve pictures a year, whereas Greg Ireland perhaps did three or maybe four. These cameramen had to turn out a picture or about twenty-eight days, and had to make it as quickly as possible, many shots had to be taken, time for experiments as there was no time for mistakes. Most of them got tired with the directors, and they were always making mistakes, and they were always making mistakes.

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though in "Citizen Kane" the times used f 11 in order to take advantage of the short-focus. The cameraman usually fairly long hours, as he had the picture all planned out in beforehand, and had to have and lights all ready in go. The artistes had to be in the room by 5 a.m. as a rule, the up was put on and then the allowed to rest until it started. The cameraman arrived at about 7 a.m., the director about 9 a.m. Laughter.

Mr. Wyler here asked allowed to make a few more. He said that while he was to Capt. Skell he had realised talking so much about Greg he had perhaps given the impression that there were no other good men. This was of course, the case, and he had work many who were real artists. He said that among them were Joe Berg, Tony Gaudio—who were very useful when they were to Mussolini's speeches—Joe time, Rudi Maté—who was known in England—and Clothier, or R.K.O. Last June looked up Capt. Clothier in New York and said to him, 'How would you like to go to war?' The reply was 'Fine' and so he had come to England to join him, and was at the meeting. Capt. Clothier had a lot of aerial photography, 20 mm. cannon shells which he kept on the target with a 4 while a turret gunner was waving his neck. Laughter.

He had quite a bit of excitement direction only the day before had brought back some very interesting pictures of German at an altitude of almost 300 with a 4m lens.

The meeting was then through questions.

Mr. A. W. Watkins said that working with M.G.M. in England, under the excellent control of Griffith and others, he had been impressed immensely by the 1 scripts when M.G.M. prepared for them from Hollywood.

He said that he had a definite feeling that one should vary the script in any way as the usual procedure.

Mr. Wyler replied that the script varied considerably depending on the individual director and the writer. He said that the director could improve the script, but he certainly should not do so. He said that the script was such as King, and in the script before sometimes too, it was found that after the script when the camera was on the set, because it

id not work out properly. oo, ideas occurred to one n other cases, one had to script because it was improve it in some way, imes the script was so ou could not change one ould be spoilt.

ler mentioned that when rs. Miniver" he was for-aving as producer Mr. nklin, who was a most roducer, and a very good ough one might disagree a script on which he had ould be certain that it roughly thought out, and ; was there by accident. n known to work on a year before he had been l with it, and very often group of writers to get ing completely harmon-ished by saying he had iticism made of a film :ture was not very good, direction was fine." In this was a paradox, and se at all. If a thing was n it could not be well it was badly played it well directed; and if it ritten it certainly would good. No good director a badly written script, ld work on it until it

a question regarding the for and against arcs, aid that the arc was not e incandescent and the s greater, although the ssion was much less. A d not give any sensation , whereas a 5 k.w. incand do so. He said incans were certainly not as arc lights.

; had found any wide use ; filters, Capt. Skall said ot in general use, and used at all in black-and-

asked how a really big Also, could Capt. Skall ; about surface-coated

said that surface-coated erishable and could not ry freely, although they cent more exposure. difficulty in using them

He understood, how-coating had now been urch was more stable.

d to the lighting of the st the light level on the nding on what the sky ould be. He set it up to h level for the slowest ng shorts which had to

be taken with a short-focus lens, then he balanced the lighting and stopped the lens down to it. He therefore set the level on the backing first; then went to the back of the set and worked-in the front lighting; then when he roughed-in the set he brought in the stand-ins and balanced up the lighting on them. Then he called in the principals for a rehearsal and watched the level against the backing to ensure that the lighting was balanced.

Mr. McMaster asked if a director found he could not get the required atmosphere in a picture with the artistes provided, could he report this fact to the producer?

Major Wyler replied that such an event seldom occurred, as the director usually had a say in the matter beforehand. In some cases, it did occur, however, as he had met certain directors who could not get what

they wanted from artistes; artistes who could not get what they wanted from directors, and producers who could not get what they wanted from anyone! (Laughter).

A member asked whether the official cameraman did the Technicolor work or whether they usually had a special Technicolor cameraman?

Capt. Skall replied that nowadays most cameramen were able to expose "Technicolor" as well as black-and-white, although in the early days there were only a few skilled "Technicolor" workers.

The President closed the meeting by saying that he was sure that all present would join him in thanking Major Wyler, Capt. Skall, and also Capt. Clothier, for a very pleasant and entertaining insight into the relations between Director and Cameraman.

LESLIE HOWARD

MR. A. W. WATKINS, A.M.I.E.E., A.R.P.S., of Denham Studios, writes:

"It was in 1931 that I met Leslie Howard and worked with him during the making of the first talking film that he made in this country, a picture called 'Service for Ladies.'

"My immediate impression was of a slim, boyish, fair-haired personality radiating charm, who appeared to enjoy every moment of his work, for, although he had already made something of a name for himself on the American stage and screen, he was completely unspoiled, and, indeed, throughout a long and valued friendship I found that no matter how great his success he remained that same delightful person. To work with him was sheer delight, for, behind that appearance of nonchalance was a very active and able brain, which could always grasp things in their right order and proper perspective.

"Leslie had an amazingly well-developed sense of humour and a laugh that was most infectious. On the other hand, however, he could show a deep appreciation of other people's troubles, and would never spare himself if he thought that he could contribute towards their solution.

"Within my own years in the British film industry I have not met any other person for whom I felt that same affection and regard, and I am quite sure that my opinion was shared by every member of the industry who came into close personal contact with him. But don't for a moment let me give the impression that it was only those who knew him intimately who had this affection for him, far from it.



He had countless admirers throughout the world whose only contact with him was to see him on the screen or stage, knowing that whenever they went to see Leslie Howard they were bound to witness a performance and interpretation which could not be bettered by any other artist, as will be remembered by his wonderful successes in such British films as 'The Scarlet Pimpernel,' 'Pygmalion,' 'Pimpernel Smith' and 'The First of the Few.'

"His loss is an irreparable one not only to the British film industry, but to the world as a whole. His contributions to our own industry will be sadly missed, for a Leslie Howard picture has always been a great contribution to our art. He has left us in that informal way he would have wished, no applause, no curtains and no last speeches, but just an indelible memory of a wonderful brain and great artist who departed at the height of his glory."

This entailed the focal plane shutter working slightly further from the film, with a consequent slight loss of efficiency. With good design and precision workmanship, however, this loss should be very small. Should the focal plane shutter be horizontal or vertically? If the horizontal work was to be avoided, then the vertical type was preferred, as the time of travel was shorter, and it was, therefore, easier to synchronise with the peak of the flash. Reloadable metal film magazines were most desirable. With the Leica there was less chance of scratched films, and again, many were liked to load their own cassettes in bulk supply. The Contax type was, he thought, a slight advantage over the Leica type in design.

Now shutter speeds to one second were desirable. A maximum speed of 1/1,000 second should be fast enough. The front flanges of the interchangeable lenses should, if possible, all be of the same size, or, at least, of two sizes, to permit of rapid and easy fitting of lens hoods and front filters.

To pass from cameras, another desirable thing was a really good flash-built precision enlarger. If one was to take larger negatives than 35 mm., the Leica Focomat II or the Leica precision enlarger were the best of instrument required. For 35 mm. only, the Focomat I met the need. Provision for tilting the enlarger was desirable for the better selection of verticals; to tilt the enlarger holder only was not sufficient.

A good mechanical timer was another need. The Bauuerle and Leica type 12, giving exposures of 1/20 seconds to 6 seconds, by 1/2 seconds, and from 2 seconds to 60 seconds, by seconds, was an ideal one. He saw no reason why a timer of this should not be made by a British firm. Firms manufacturing developing tanks might, he thought, consider the production of a 35 mm. dual-groove tank, loading from the front like the Leitz darkroom-loading tank. There were a number of advantages in favour of this type. The field for auxiliary apparatus to be used in conjunction with the miniature camera, such as copying machines, microscope attachments, etc., was very large, but real precision work was called for if they were to be satisfactory.

To produce a really good precision enlarger called for a very big expenditure on plant, jigs, fixtures, tools, gauges and testing instruments of the highest class. For instance, in the case of the Leica, the shutters were automatically wound and released 1,000 times to make sure that the

width of slit and the spring tension remained up to standard. All springs had to be tested for resilience or torsion. Lens flanges had to be tested for parallelism with the plane of the film, with the aid of a collimator. These were just a few of the things to be tested in addition to the testing of the materials. Working limits of 0.0005 inches were called for in places.

As regards lenses, he thought that British lenses, after the war, would be found to compare with the very best products of Germany. The question of the coating of the interior surfaces of lenses to stop reflection was another point to be considered.

The CHAIRMAN pointed out that it would be virtually impossible for one manufacturing firm to produce a camera having all the desirable qualities, because patent difficulties would be in the way.

WING-COMMANDER BELLAIRS agreed with Mr. Harris that the turret head was usually a useless and cumbersome article, but he thought there was room for an alternative choice between the ordinary removable head and a turret head in the case of cameras for the use of Press photographers, who might find a turret head desirable. Again, a man going in for scientific exploration or nature work might, on occasion, find a use for it. He, himself, had found when trying to photograph, more or less successfully, wild animals, that it was necessary to change the lens a great deal more quickly than in the ordinary way. As it was, one did not

change it, and hoped that by running as fast as one could for a certain distance one would just get the object in the frame.

He quite agreed with the split-field method of focusing. This was a very strong point. He was also greatly in favour of the removable back, which gave one the opportunity of changing the film in the dark and of doing all sorts of things which it was convenient to do. On the other hand, if one was in Egypt, and countries like that, the use of a camera with a removable back might be almost impossible, on account of the infiltration of sand or dust into the working parts of the camera. Elsewhere, where this was not a difficulty, he thought that the removable back had it every time.

MR. SOLLY said that one point which Colonel Symon had not mentioned was the noise made by some of the focal plane shutters. If one was taking photographs in a theatre, this noise might be very disconcerting. If the shutter could be cushioned in some way it would be a great advantage.

MR. STILLBROOK had found the Leica, without a carrying case, too small to get hold of comfortably.

MR. HARRIS said that he would like to hear the views of members on the question of the loading of film and the number of exposures, desirable, whether, say, 36, 18 or 12. He believed, personally, that after the war there would be a great increase in popularity of the camera with an 18-exposure loading.

RUSSIAN WAR FILMS

"The documentary, scientific and military films produced in the studios of U.S.S.R. have one basic, main purpose—to show the Soviet people themselves, and the rest of the world as well, how the Soviet citizen is living and fighting; how as the result of the war factories and plants have been established in new localities; how the tempo of production has increased; and how the people have contributed and sacrificed to hasten the defeat of the enemy. And, despite the exigencies and demands of war, cultural, educational and scientific films continue to be produced in greater numbers than before. The war has not hindered or stopped the cultural growth of the country," writes G. I. Iraky, in an article on "The Documentary, Scientific and Military Films of the Soviet Union," in the December, 1942, issue of the *Journal of the Society of Motion Pic-*

ture Engineers. He continues: "More than a million feet of documentary film have been taken by our cameramen from the time the Hitlerite hordes suddenly attacked our country.

"During the years 1940/2 as many as 450 scientific and educational films containing 1559 reels and 1,500,000 feet were made. These films cover various subjects, such as geography, history, technology, agriculture and military tactics.

"The People's Commissariat of Education has a cinema department that has approximately 20,000 16 mm. projectors, which are furnished for lectures to the high schools upon request. Many of our technical and educational films are so effective that they enable us to teach our people without the actual presence of a teacher."

THE BOOKSHELF

Prism and Lens Making. By F. Twyman. London: Adam Hilger, Ltd. Price 15s.

One of the peculiarities of the optician's art is that work of high accuracy can be produced with primitive equipment. It is quite possible, for instance, to produce a mirror for a small astronomical telescope with little more than grinding and polishing materials, two pieces of glass, one of which becomes the mirror, and a post to hold the glass. There is indeed a mention in Mr. Twyman's book of the "flonking iron" with which the surface of a piece of glass may be flaked roughly to the curvature required—a technique dating back to Palaeolithic times! The reason for this peculiarity of optical work is that if two surfaces are ground together until they fit all over, they are bound to finish up with an accurate flat or spherical form. Polishing is carried out, usually, with a pitch-covered tool, pitch having the property of keeping its form against quickly acting forces, but yielding continuously under steady forces, so that the polishing tool maintains the same shape as the glass being polished. By such means spherical surfaces can be made with local hills and dales no more than a millionth of an inch in height or depth.

Mr. Twyman is managing director of Adam Hilger, Ltd., a firm world famous for its scientific instruments. What is probably not so well known is that this firm has also been very successful in mass producing optical components. Its efforts in this direction during the 1914-1918 war were of great importance. Mass production cannot, of course, be carried out with primitive equipment and Mr. Twyman played a leading part in devising machinery capable of giving accurate mass production.

Mr. Twyman is, therefore, well qualified to write on prism and lens-making. The book he has written is most interesting, and a photographer who has any interest in the way lenses are made could not be referred to a more authoritative source of information. The author has confined himself in the main to the methods used by his firm, but has also given a brief historical sketch and an account of the various ideas put forward for getting the way in which a lens is made. Much of it is of testing optical materials, glass, and the methods of grinding and polishing. The book is a very interesting and useful reference. It is clear that although in this

edition most attention is paid to those methods of which the author has personal knowledge, he also hopes that others will disclose their methods so that "a reliable and complete text might in that way become available, which would raise opticians to a level of proficiency not attained in our generation." If this should be possible, it would perhaps be as well to give a little more attention to the more theoretical parts of the subject, such as the effect of pressure and velocity on grinding and polishing, and the attainment of motions leading to equal rates of working all over the surface of the glass. Some information of this type has already been published.

Meanwhile, there must be many in the much expanded optical industry who will be grateful for so full and practical a description.

E. W. H. SELWYN.

The American Annual of Photography, 1943. Edited by F. R. Fraprie, F.R.P.S., and Franklin I. Jordan, F.R.P.S. Published by American Photographic Publishing Co., Boston. London Agents: Sands, Hunter and Co., Bedford Street, W.C.2.

The fifty-seventh volume of this well-known annual presents the former well-known features except that the commentary on the pictures this year is by Mr. Jordan, as injury to an eye has compelled Mr. Fraprie to spend some time in hospital. All his many friends will learn this with regret, and wish him a speedy and complete recovery.

The literary part of the book consists of about twenty articles dealing with a variety of subjects, mainly technical, appealing to all kinds of photographers. Personally I find Mr. Fraprie's reminiscences of "Nationalism through the years" the most interesting and instructive. Mr. Jordan has done the critical review of the illustrations most admirably, and proved himself a worthy substitute for his colleague. Whether photographers will be much wiser for reading Mr. Moly Nagy's article on "Space-time" is at least doubtful, and I hardly imagine his illustrations will persuade American photographers to a new vision.

The seventy-two full-page reproductions offer a wide variety of subjects, some of which are already familiar to the walls. The printing is of a high standard, as usual.

Mr. W. A. White's feature is continued in slightly amended form, and

will form an item of interest to all concerned with photographic exhibitions. As previously noted, the tendency is for former champions to become less prolific, and to be supplanted by newcomers, who in turn will no doubt disappear to give place to others. War conditions cannot prevent Great Britain to make a very poor showing. We are credited with only seven exhibitors last year, among whom not even Alex. Keighley figures.

The volume demonstrates very clearly that war restrictions have not yet affected United States publications to any noticeable extent.

J. D. JOHNSTON.

Report of Proceedings of the 17th Conference of ASLIB, 1942. Published by A.S.L.I.B., 31, Museum Street, London, W.C.1. Price 6s.

The Association of Special Libraries and Information Bureaux, now so well known under the initials A.S.L.I.B., might well be considered as one of the most valuable indices of the level of our civilisation. There can be no single person of proven intellectual attainment in the land to whom A.S.L.I.B. is unknown, there is no organised research body in Art, Science or Technology that has not thankfully made use of A.S.L.I.B. in the furtherance of its work. That the Association should have reason to mention that its services "have been restrained by the usual British public and official disregard of information services and by the old A.S.L.I.B. anxiety—lack of money, is at once a scandal and a warning. Of the papers read before this conference, photographers will naturally turn to that by Mr. E. Lancaster-Jones, the Keeper of the Science Library, on "Microfilms in Libraries," yet there is not one of the nine papers published that is not of particular interest at the present time. Two of them are worthy of special mention. "Training in the Use of Libraries as Part of the School Curriculum," by C. H. C. Osborne, and "Instruction in Library Use: A Needed Addition to the University Curriculum," by Professor R. S. Hutton. The librarian of any library, any senior research or scientific worker, and any teacher of science will testify to the urgent need for such training and instruction and every intelligent member of the public has that same necessity driven home by such items as the B.B.C. Brains Trust and its increasingly numerous copyists.

This report should be studied in detail by all who recognise what an indispensable part A.S.L.I.B. plays in the distribution and co-ordination of special information.

H. W. GREENWOOD.

Photo Tricks. By Edwin I edition. The Focal Press, and New York. Price t.

is book first appeared in 1940, attention was drawn y valuable hints and ideas d. The passage of time has reduced its value in this and the appearance of a tion may well provide a those who overlooked it the o now add it to their book- i brimful of ideas and sug- vering so wide a field that ult to think that anyone id it interesting and valu- matter what particular us photographic activities a book that should not only r reference, but frequently and carefully studied for f the beaten track.

H. W. GREENWOOD.

Complete Projectionist. By I Cricks, F.R.P.S. Edited Benson. 3rd edition, with tary chapters. Kinemato- lications, Ltd., London, ice 8s. 1d., post free from ress.

rd edition of a deservedly anual for the kine projec- s undergone a thorough fuch new material has been hroughout the book, in new chapters in tungsten rge lamps, stereophony, jection and sub-standard the projectionist the book y, it is also a very valuable n to cinematography from ion point of view, and a formation on all subjects to those who like to have a book dealing with the de of a subject. Incident- extremely cheap for these

H. W. GREENWOOD.

Products for Industrial use of X-rays and Gamma rays.

his title, Messrs. Ilford, ave issued a most useful o one in the engineering or al industries is in any o the value and the very plications of X-ray and r testing, nor is it in any ; the very rapid develop- is non-destructive method as called for a variety of suitable for the many astings, forgings and other etal components that in- war alike call for. The this latest Ilford booklet

is to discuss this need for special materials, and to indicate how it has been met by Ilford X-ray films and papers, intensifying screens and chemicals. There is much valuable information, in particular the curves indicating the effect of screens on the speed and gradation of Ilford films, characteristics of X-ray paper compared with film and the time-temperature curve for Ilford developers. No X-ray technician should be without a copy of this booklet.

H. W. GREENWOOD.

Photography as an Aid to Scientific Work.

The appearance of the Seventh Edition of this Ilford Booklet is a matter upon which Messrs. Ilford Limited may well be congratulated. Scientific workers are rarely in a position to determine off-hand the exact material which will best serve there purpose to some definite end. Years ago Ilford Limited produced in the First Edition of this booklet, a general guide which has proved of real service to an ever-increasing number of workers. This revised edition contains vastly more information than was available in earlier days, in particular the section (p. 2) on Photographic Requirements common to all Scientific Work, and in the extended and very full details of Ilford Products for Recording Instruments (pp. 11-15). No laboratory should be without a copy of this most useful compendium.

H. W. GREENWOOD.

Reprints

AMATEUR PHOTOMICROGRAPHY. By Alan Jackson, B.Sc., A.I.C. Second edition. 7s. 6d.

MAKING COLOUR PRINTS. By Jack H. Coote, F.R.P.S. Fifth edition. 6s.

ENLARGING. By Dr. C. I. Jacobson. Third edition. 9s. 6d.

LIGHTING FOR PHOTOGRAPHY. By W. Nurnberg, F.R.P.S. Third edition. 12s.

MY WAY WITH THE MINIATURE. By Lancelot Vining, F.R.P.S. Third edition. 13s. 6d.

ALL ABOUT BETTER PRINTS. By F. W. Frerk. Eleventh to fifteenth thousand. 1s. 6d.

ALL ABOUT COPYING. By H. W. Greenwood. Eleventh to fifteenth thousand. 1s. 6d.

ALL ABOUT DAYLIGHT INDOORS. By Hugo van Wadenoyen, F.R.P.S. Eleventh to fifteenth thousand. 1s. 6d.

ALL ABOUT FILTERS. By Dr. C. I. Jacobson. Twenty-first to twenty-fifth thousand. 1s. 6d.

ALL ABOUT FOCUSING. By F. W. Frerk. Sixteenth to twentieth thousand. 1s. 6d.

ALL ABOUT THE RIGHT MOMENT. By Alex. Strasser, F.R.P.S. Eleventh to fifteenth thousand. 1s. 6d.

ALL ABOUT TRACING TROUBLES. By A. Merryweather. Eleventh to fifteenth thousand. 1s. 6d.

All the above new editions have been recently issued by The Focal Press, Ltd., 31, Fitzroy Square, London, W.1. The last seven titles are handy pocket text books in the popular New Photo Guide series.

OBITUARIES

J. B. Portway, Senr.

It is with sincere regret that we have to record the death on May 5th this year, at the ripe old age of 87, of Mr. J. Bernard Portway (Senior), of Ealing, who became a Member of The Royal Photographic Society in 1909, and was elected a Fellow in 1919.

Those of us who have been interested in the development of Pictorial Photography will remember that it was he, in association with Bertram Cox, J. Dudley Johnston, T. H. B. Scott, F. C. Tilney and others, who were mainly responsible for the inauguration of the Pictorial Group of the Society.

As a Member of the Ealing Photographic Society, which he joined in 1903, and later on held for many years the office of its Treasurer, he acted as its representative on the late Affiliation of Photographic Societies, and many of its Committees.

Portway's pictorial work was chiefly landscape, and always dis-

tinguished for its depth of feeling and the quiet sentiment it conveyed.

Although it is some years since he took any active part in the world of Photography, his contribution thereto will always remain in our memories

G. C. WESTON.

Harold Wood

It is with much regret that we have to record the death of Mr. Harold Wood, which took place on June 2nd.

Mr. Wood joined the Metropolitan Vickers Electrical Company as far back as 1913, but left for war service in 1915. He came back to the Publicity Department in 1919. He left the company in 1921, but rejoined it in 1928. He never spared himself in carrying out his work and was available at all times, whether personally convenient to him or not, when circumstances demanded.

He joined The Royal Photographic Society in 1938 and was admitted to the Associateship in the same year.

ITEMS OF INTEREST FROM VARIOUS QUARTERS

THE R.P.S. MEMBERSHIP

Perhaps the most encouraging factor which emerged from the Annual Report of the Council of the R.P.S. for the year 1942 was the net increase of 397 in the membership. Actually, 597 new members were elected during the year, but the membership of 89 of these began in the present year; losses by resignation, death and default accounted for the remaining 111.

In 1924, when its membership was limited to 2,000, steps were taken to increase that figure to 5,000. Its actual membership in that year was 1,430, and it was not until 1933 that it passed the 2,000 mark.

The curve which we reproduce—a simplified version of a much more informative original for which we are indebted to Mr. G. C. Weston, Hon. F.R.P.S.—shows that the growth of the membership has indeed been a slow process; there has been nothing sensational or dramatic about it.

The original curve is displayed in the entrance hall at Prince's Gate.

The figure of 3,592 at which the membership stood at the end of 1942 brings nearer the maximum number which may be elected—5,000—and makes its realisation appear much more attainable than seemed possible even to the Society's most enthusiastic supporters, when it was authorised. To-day, every assumption that the figure will be reached appears reasonable, and it is also reasonable to assume that it will be reached in the course of the next few years. The war has stimulated not only technical developments but a widespread interest in Photography. When, after the war, the full benefit of the advances become available to the general public, its popularity will be greater than ever, and the ranks of serious workers continually enlarged by newcomers who succumb to its spell.

The power that it holds to capture the imagination of those who practise it is one of the attributes of Photography. It casts the same potent spell on all who make use of it, whether as a hobby, as a career or as an aid in some branch of science or department of commerce or industry. New applications for it are constantly being discovered, and every new application creates a new band of enthusiasts.

A membership of 5,000 should produce an income of between £9,000 and £10,000 annually, allowing for

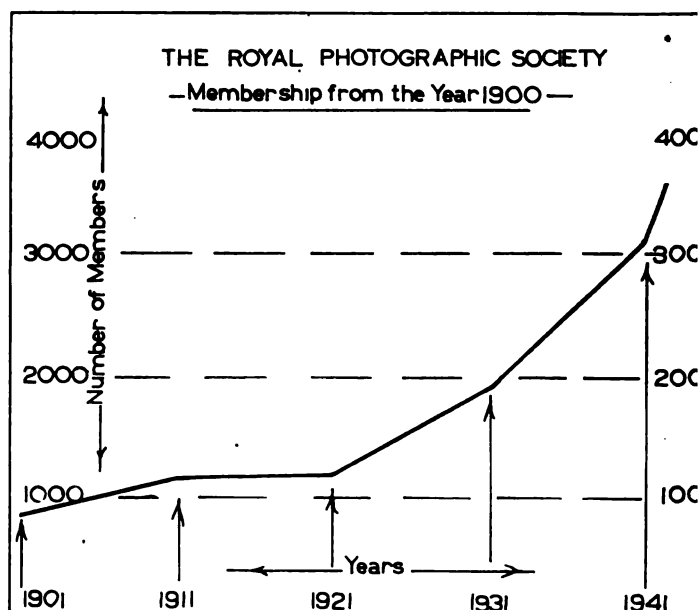
junior members and life composition fees. It may be assumed that before the present limit of 5,000 is reached steps will be taken to increase the figure so that such an annual income is not to be considered as the ultimate "ceiling."

A really substantial income opens up many possibilities for the Society's future development. It would, of course, be accompanied by increased overhead charges, for a larger membership would involve the engagement of additional staff, a more expensive Journal and other general expenses. It would, also, however, enable it to do many things which in the past it could not do for financial reasons alone.

Most important of all, it would

that the Society was unable to put out such a programme when lease of its Russell Square premises expired in 1939, and it was obliged to compromise with the acquisition of its present headquarters.

In view of the increase in its membership, the Society is rapidly growing these premises. A building erected to designs especially prepared to provide the Society with accommodation and facilities it requires, and to allow for expansion activities, would represent an expense on a big scale, and finally realise the aspirations of those friends who however remote the prospects of its realisation appeared, never lost sight of that they would ultimately be attained. A building which included accommodation which would meet the future as well as the present requirements of the library, lecture hall equipped for still standard and sub-standard projection, suites of exhibition galleries, dark room and working facilities, office accommodation, housekeeper's quarters, erected



afford the opportunity of building up a really substantial reserve fund for the purpose of acquiring a suitable site and erecting upon it those premises designed for its particular functions which alone will enable the Society to perform them in a fully satisfactory and adequate manner. However convenient and adaptable they may be, no existing premises can fully respond to the Society's special requirements. It was unfortunate

that the Society was unable to secure a convenient site, would constitute central headquarters not only for the Society, but for Photography in general. Such a building is the Society's need.

There are many other ways in which a substantial income could be advantageously applied to the furtherance of the Society's objects, the advancement of Photography. The full benefit of the library, for example, could only be secured by

a resident librarian, who is available to assist members with the information constantly sought, for the old naturally link up with the information department. The Collection would also, in time, find its home in

at times there is no reason financial one, why every the *Journal* should not be on the lines of the April Photography in Science, Art and Industry." Every issue could contain contributions covering all the Photography which are in the Society's member-photographic art gallery section present each month the important works of one of our photographers. It would be, too, to reproduce on a large generous scale selections from the Society's exhibition which will play a big part in the of Photography, and its representation among the illustrations would be sec-

ted catalogues of the Collection and the are further possibilities opened up by a continuous upward trend of the ip curve.

Future Camera Group
F" of the Postal Portfolios complete. Steps are being taken to form Circle "G." A number have already been received. Secretary for Circle "G" Miss Helen Stewart, "Dunbar Warren Drive, Kingswood,

lowing is the proposed programme of lectures for the Group:—
1943, at 3 p.m. "Making a Good Print." By Mr. R. H. R.P.S.
30th, 1943, at 3 p.m. "Pictures with the 2½in. Square," illustrated by slides. If possible, there will be a discussion on the merits of the 2½in. square. By Mr. B. Hutchings,

on 4th, 1943, at 3 p.m. "The Art of Literature and Development of Interest to the Miniaturist." By Mr. Percy W. Harris,

on 15th, 1944, at 3 p.m. "The Art of the Miniaturist." By "Ricardo." On 19th, 1944, at 3 p.m. "The Art of the Miniaturist." By Mr. D. McMaster,

Mr. Alexander Keighley's Diamond Jubilee

This year, Mr. Alexander Keighley, Hon. F.R.P.S., celebrates his Diamond Jubilee as a photographer.

All over the world photographers will unite in congratulating the veteran pictorialist upon the happy occasion.

Mr. Keighley's name is a household word in photographic circles. He is in himself a photographic institution. No salon of any importance in any part of the world was complete without his representation. To-day, after



Alex. Keighley, Hon. F.R.P.S.

A portrait by R. Chalmers, Hon. F.R.P.S.

sixty years of exhibiting, and lecturing, he is as enthusiastic as ever. Never for a moment has photography ceased to exert its fascination for him.

It would be inconceivable that such an occasion could be allowed to pass unnoticed, although war-time conditions must necessarily restrict the scale of the celebrations.

In his native county of Yorkshire, an exhibition of his work is to be held at the Cartwright Memorial Art Gallery, at Bradford, during this month and running into August. This is organised by the Yorkshire Photographic Union, of which Mr. Keighley is President, and during it a special luncheon in his honour will be held in Bradford.

The Royal Photographic Society is naturally anxious to associate itself with the noteworthy occasion, and will be represented at this function. It will also exhibit at Prince's Gate, in November, the photographs which will be included in the Diamond Jubilee Exhibition at Bradford. Its main recognition of the occasion,

however, will take the form of a volume of Mr. Keighley's pictures, with a critical appreciation of his work and its significance, by Mr. F. J. Mortimer, C.B.E., Hon. F.R.P.S., F.R.A.S., and a biographical sketch by Dr. J. L. Hankey. This volume will be published by the Pictorial Group, and it is hoped that it will be ready for distribution during the present year.

We shall refer to the local celebrations in a later issue, and in the meantime are happy to announce the arrangements which will serve to give the celebrations that wider character which alone can do adequate justice to Mr. Keighley's career and stature as a photographer.

Lectures and Demonstrations

We have received particulars from Messrs. Johnson & Sons of the revised series of lectures and demonstrations which are available to photographic societies. They are as follows:—

Lectures of general interest to all members—

1. Standardised Development.
2. Aids to Better Prints.
3. How to Gain Fine Grain.
4. How to Criticise Your Own Pictures.

The first three are illustrated by means of enlargements and the last lecture by means of lantern slides.

Demonstrations for Junior Members (material being supplied free of charge)—

1. Correct Development by the Time and Temperature Method.
2. How to do Your Own Developing and Make Your Own Prints.
3. How to obtain Fine Grain on very small negatives.

Early booking is desirable, and to prevent clashing with other Societies, alternative dates should be submitted. Application should be made by post to Messrs. Johnson & Sons, Manufacturing Chemists, Ltd., Hendon Way, London, N.W.4.

Salons in War Time

"There is still some talk about the advisability of continuing the holding of photographic salons during the war," writes Mr. Grant Duggins, in the May issue of the *Journal of the Photographic Society of America*. Mr. Grant Duggins, who is an Associate of the R.P.S. is at present serving in the U.S. Army. "Speaking as a salon exhibitor," he goes on, "and as one who enjoys photographic exhibitions, I am firmly of the opinion that the continuance of salons is of extreme importance to

all the people of America. Photographic salons serve to remind us of the good things in life that are worth fighting for; they are a link between the happy days of yesterday and the happier days of peace which lie ahead. People like to be reminded of the existence of the good and lasting things of life, too, you know. . . . A phrase, a song, a picture may be the straw that balances our hopes and faith against our worries and uncertainties, and enables us to maintain our equilibrium and carry on, our burdens growing lighter as we contemplate the good things that life still holds."

A Colour Club

In the same May issue of the *Journal of the P.S.A.*, Mr. H. J. Johnson describes a new type of camera club which has been founded in Chicago, which, he says, is unique in photographic organisations.

The club is the Chicago Area Colour Camera Club, and it has aroused interest "not only because it is exclusively for colour workers, but also because its methods and programmes have enabled it to continue to increase in membership despite the war, and to attract a high percentage of its members to meetings."

Mr. Johnson continues: "In large clubs, intimate contact between officers and members is difficult to maintain, and the feeling of fellowship is often lost. The Colour Club avoids this with an executive committee which enables officers to know all members personally, but at the same time allows a direct voice in the affairs of the club. This committee is composed of the officers and includes at its meetings a sufficiency of regular members, so that by the end of the year each member has attended one meeting."

"At this meeting he is a full executive committee member, with the same weight as the officers in discussion and voting. These committee meetings are held at times other than the regular club meetings."

"The club differs from most in that it has no constitution. Whatever members have desired to do they have done, shaping their course by experiment and forming precedents for future guidance. What they have found fitting and efficient they have kept; what was not was discarded."

Other novel methods adopted by the club are the rule that all the year's income, with the exception of the barest reserve, is expended during the year and the presentation of such useful articles as colour charts, brushes for removing lint from glass slide covers, colour backgrounds, etc., to members.

The club prides itself upon the high percentage of women members—about 40 per cent—and on another important difference from other clubs in that its meetings start on time and end on time. "Many clubs do not realise," Mr. Johnson comments, "that sloppy starting and stopping times discourage attendance."

Mr. Johnson concludes: "New colour films and processes after the war will cause colour photography to increase to such an extent that clubs will be formed for the new field, or special colour sections added in the standard camera clubs. The experiments and methods of the Chicago Colour Club will be valuable in guiding the formation of these new clubs or special club sections."

Ilford Chairman's Golden Jubilee

The congratulations of the British photographic industry will be extended to Mr. B. L. Drake, F.C.I.S., the Chairman of Ilford, Limited, on the completion of fifty years' service with his company. To mark the occasion a Golden Jubilee Luncheon was held recently at Connaught Rooms, W.C.2, at which Mr. and Mrs. Drake were entertained by Mr. Drake's colleagues on the Ilford Board of Directors and the principal members of the staffs of the various factories and offices.

Colonel F. W. Evatt, the Deputy-Chairman of Ilford, Limited, who presided at this happy function, congratulated Mr. Drake on his achievement and spoke of his outstanding services to Ilford, Limited, and expressed the hope that the company would have the benefit of his leadership for many years to come. He presented Mr. Drake with an inscribed gold watch in accordance with the practice of the company in the case of all those serving with it for fifty years.

A gold cigarette case was handed to Mrs. Drake by Colonel Evatt, who expressed the gratitude of the company for her watchfulness and care of her husband during their married life, which had contributed in no small measure to the success which he had attained.

Manchester A.P.S.

The resignation of Mr. Harry Chapman, A.R.P.S., from the secretaryship of the Manchester Amateur Photographic Society has been accepted with very much regret by the Council.

Mr. Chapman had held the office for fourteen years and had contributed valuable services to the Society during that period.

He has been succeeded by Mr. Charles Eshborn, A.R.P.S., of Worsley Road, Farnworth, Lancashire (Telephone: Farnworth 518).

Mr. Eshborn has been an indefatigable worker for the Manchester A.P.S. as exhibition secretary and other capacities, and the Society is indeed fortunate in being able to entrust the secretaryship to hands no less capable than those relinquishing it.

Proposed Memorial to the late Major F. C. T. Hadley

At a general meeting of the Photographic Convention of the United Kingdom, held in London on 26 May last, it was decided unanimously that a Fund should be raised among members of the Convention for a memorial to the late Hon. Secretary, Major F. C. T. Hadley.

Major Hadley, among many public activities, aided materially and with counsel a children's holiday home, situated near Conway, N. Wales. The home is called "The Hadley Home," as it was founded by Major Hadley's grandfather, for Birmingham workers' children.

A wish has been expressed by Mr. Hadley, his widow, that the memorial should include:—

1. A metal plate, suitably engraved, in memory of Major Hadley; to be placed in the premises of the Birmingham Photographic Society. Major Hadley was a prominent member of this Society for many years, and he filled the office of President, 1937-38. It is intended that the cost of such a plate should be small.
2. A Fund to be applied to the conversion and equipment of an existing field attached to the Hadley Home, as a Playing Field for the children living in the Hadley Home.

It is expected that a sum of at least £100 will be required to meet the cost of the playing field and equipment.

As the membership of the Convention now numbers about 85, it is hoped that the sum required will be quickly forthcoming for this most deserving object, which will be a perpetual memorial to such a kind friend and genial Secretary as was Major F. C. T. Hadley.

Contributions should be sent and cheques made payable to: "Major Hadley Memorial Fund," c/o Miss E. E. A. Beattie, Hon. Asst. Secretary, at 67, Kings Road, Bournemouth, Hants.

It was agreed that the current subscription to the Convention, which is now due, should be fixed at 2s. 6d.

S. PROCEEDINGS UNCIL MEETING

ING of the Council of The Photographic Society was at 16, Prince's Gate, June 7th, 1940, when the are present: The President, McMaster, in the chair; Baines, A. J. Bull, G. L. V. Chilton, J. H. E. Dent, Fred Green, Herbert, T. Midgley Illing, Johnston, H. Bedford Mrs. Rosalind Maingot; J. Mortimer, Arthur S. Pledge, S. Schofield, B. Scott, W. Symon, Hugo van Wadenoyen, eston.

ers
wing Candidates were
r Membership:—

Abbot, Delicais, Num.
Gro., Mexico.
ams, 33, New Brighton
ley, Christchurch, N.E.2,
land. (Member, Christ-
Photographic Society.)
Ibrecht, Army Pictorial
A.P.O., U.S. Army.
May Anthony (Miss), 1,
View, Pinner, Middlesex.
Austin, A.I.B.P., 30,
Avenue, Harrow Weald,
x.
mry Banyard, 43, Wood-
mne, Gravesend. (Mem-
Stereoscopic Society.)
arlaup, Kingston House
10, Ennismore Gerdens,

Barton, 14, Westgate
S.W.10.
onard Bean, Grosvenor
Old Post Office Yard,
tgate, Chester.
onald Albion Beasley,
me, 9, Queen's Road,
am. (Member, Man-
Amateur Photographic

Blenkhorn (Mrs.), 35,
e Avenue, Birkley,
field. (Member, Hali-
ographic Society.)
Richardson Billings, The
ads, Chislehurst Road,
od, Kent.

Brain, 67, Grayswood
ad, Quinton, Birming-
(Member, Birmingham
phic Society).

Alban Brayshaw,
E., 1, Trent Avenue,
W.5. (Member, Napier
Club).

William Burrows, 42, Silhill Hall
Road, Solihull, Birmingham.
(Member, Solihull Photographic
Society.)

G. R. Davis, Raigersfeld, Mote
Park, Maidstone.

Allan Edwards, 8, Swan Hill Road,
Scarborough. (Member, Scar-
borough Amateur Photographic
and Cine Club.)

Arthur Davies, 73, Manor Road,
Blackpool. (Member, Black-
pool and Fylde Photographic
Society).

V. Entwistle (Mrs.) (Vivienne), 7,
Hamilton Mews, Hamilton Place,
W.1.

Evelyn Frith (Miss), 5362, Gran-
ville Street, Vancouver, B.C.
(Member, The Vancouver Photo-
graphic Society).

Arthur W. Frazer, 2525, Ontario
Road, N.W., Washington, D.C.,
U.S.A.

William Gregory, 24, Chestnut
Avenue, Crosby, Liverpool 23.
(Member, Manchester Amateur
Photographic Society).

Samuel John Gilbey, 28, Fair-
holme Gardens, Finchley, N.3.

George Archibald Greenhorn
(Capt., R.E.), The Rowans,
Cambuskenneth, Stirling.

Jeanne Ray Hartley-Urquhart
(Miss), 3, Croft Gardens, Ruislip,
Middlesex.

Edward F. Ishii (Sergeant), 64th
Troop Carrier Squadron, A.A.F.,
A.A.B., Alliance, Nebraska.

Hilda Edith Jefferies (Miss), 14,
Grove Hill Road, Handsworth,
Birmingham 21. (Member,
Birmingham Photographic Soci-
ety and Handsworth Photo-
graphic Society).

L. R. Kemoe, 7305-18 N.W.,
Seattle, Washington, U.S.A.

Douglas Krauss (Captain), 4, Wel-
lington Court, N.W.8.

Edwin Alfred Lambert, 30, May-
fair Avenue, Great Crosby, Liver-
pool 23. (Member, Liverpool
Amateur Photographic Associa-
tion).

John Lathbury, Manchester Unity
Building, 185, Elizabeth Street,
Sydney, Australia.

Clifford Ernest Maney, F.A.I.,
F.V.I., Avon, 11, Ockley Road,
Streatham, S.W.16.

George Robert Mott, Twidges,
Boundary Road, West Bridg-
ford, Nottingham. (Member,
Nottingham and Notts Photo-
graphic Society).

Cyril Markie, 79, Allesley Old Road,
Coventry. (Member, Alvis
Photographic Club, Coventry).

William Charles Noise, 11, Frinds-
bury Road, Strood, Rochester,
Kent.

Peter Lloyd Morgan, 33, Here-
ward Gardens, Palmers Green,
N.13.

Donald Prescott Plummer, M.A.,
B.Sc., c/o C.P.I.M., Curacao,
Netherlands, West Indies.

William Charles Powell, 48, Morley
Avenue, Edmonton, N.18.

Thomas Waymouth Pringle, 42,
Upland Road, South Croydon.
(Member, Croydon Camera Club)

Ambrose Robinson, Marigold, 47,
South Beach Road, Hunstanton.
Leslie Scholefield, 35, Bridle Road,
Purley, Surrey.

Simon Simons, 444, Lytham Road,
Blackpool. (Member, Blackpool
and Fylde Photographic Society)

Wray Staveley (Miss), Research
Laboratory, Kodak, Limited,
Harrow. (Member, Kodak
Works Photographic Society).

Eric Fred Teal, 34, Stanley Road,
Northwood. (Member, Kodak
Works Photographic Society).

Thomas Thorburn, 12, Mabel
Street, Meadows, Nottingham.
(Member, Nottingham and Notts
Photographic Society).

Leslie A. Tompsett, 209, Sherland
Building, South Bend, Indiana,
U.S.A.

Arthur Edward Jarvis Vickers,
F.I.C., F.R.M.S. (Dr.), Hazel-
dene, 66, Junction Road,
Norton-on-Tees, Co. Durham.

Cecil Hugh Williamson (Captain),
Royal Corps Signals, Warren
Grange, Rannoch Road, Crow-
borough, Sussex.

Frederick Bernard Winter, 7,
Kerrison Road, Ealing, N.5.
(Member, Hammersmith Hamp-
shire House Photographic Soci-
ety).

Bernard Frank Woodward, 19,
Arthur Avenue, Fairweather
Green, Bradford. (Member,
Bradford Photographic Society).

JUNIOR MEMBERSHIP

Norman Percy Arculus, 12, St.
George's Road, Footscray, Sid-
cup.

M. I. Hardy, c/o 16, Prince's Gate,
S.W.7.

Ronald Stanley Hildersley, Sum-
merdawn, Butts Hill Road,
Woodley, Reading.

Stanley Rees Morgan, 31, Burnaby
Street, Cardiff.

John Peter George Smith, Finches,
Church End, Paglesham, near
Rochford, Essex.

Victor Ini, 54, Brodie Avenue,
Liverpool 18

Frank Walker, 22, Chesterfield Road, Brimington, near Chesterfield. (Member, Chesterfield Photographic Society).

Obituary

The Council regretted to learn of the death of the following Members: Capt. J. D. S. Pendlebury (on active service, Crete, 1941); B. J. Piercey, Kelso, Roxburghshire.

Admission to Affiliation

On the recommendation of the Executive Committee of The Central Association, the Council had pleasure in admitting to Affiliation the London and Worcester Postal Portfolio (11 members). Secretary, Mr. Harold Edward Cowley, 45, Holyoake Walk, Ealing, W.5.

Investment

It was reported that in accordance with the recommendation of the Finance Committee, £2,000 had been invested in 2½ per cent National War Bonds, 1951/53, and £2,000 in 3 per cent National Savings Bonds, 1950/70.

Gifts

The Council accepted the following gifts with much appreciation: A copy of "Photographic Trade Bulletin," bound volume, Nos. 25-36, for the Library, from Mr. Thomas A. Scruby (Member); a copy of "Inchmahome and the Lake of Menteith," illustrations and notes by John A. Stewart, F.S.A. (Scot.), for the Library, from Mr. John A. Stewart (Member); a copy of "David Octavius Hill, Der Meister Der Photographie," by Heinrich Schwarz, Insel-Verlag, Leipzig, 1931, for the Library, from Pte. H. Gotthelf; a copy of "Bermudiana—Bermuda on Parade," by Ronald John Williams, photographs by Walter Rutherford, for the Library, from Mr. Walter Rutherford (Associate), of Bermuda.

New Premises' Special Fund

The following donations are gratefully acknowledged:

	£	s.	d.
Amount previously acknowledged	11286	17	3
Anonymous (6th donation)	1	16	0
Thomas R. Berry	10	6	
G. L. A. Blair (3rd donation)	1	1	0
Major M. J. Burelbach (2nd donation)	1	1	0
L. P. Flory, Esq. (2nd donation)	17	0	
J. A. Mackay, Esq. (4th donation)	1	0	0
K. F. Rosenberg, Esq.	1	1	0
E. S. Tompkins, Esq. (3rd donation)	4	4	0
L. E. Varden, Esq. (2nd donation)	17	3	

ANNOUNCEMENTS

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2 2s. 6d. Group subscriptions, which became due for renewal on the same day, are as follows: Scientific and Technical Group, 7s. 6d.; Pictorial Group, 5s.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s.; Kinematograph Section, 5s.

Group subscriptions may be included with the Annual Subscriptions, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscriptions to the Society through their own Bank to The National City Bank of New York, in New York, or direct to The National City Bank of New York. Such subscriptions should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square Branch, London, account. Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to ask them to mention their names, addresses and status (Fellow, Associate, Member); and Members making the remittance direct to The National City Bank of New York are requested to give this information.

It is important to note that payment should be made

"For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the same time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

Mrs. Lily Waters (4th donation)	£	s.	d.
Dr. E. P. Wightman (3rd donation)	1	1	0
Jack Wright, Esq.	9	9	
	1	4	5
	£11302	0	2

Fellowship and Associateship

Notice is hereby given that applications for the Fellowship and Associateship in all Sections will be considered by the Advisory Committee appointed by the Council. Associates desiring to take up the Fellowship, and Members desiring to take up the Associateship in any Section, should address their applications to the Secretary not later than April 1st, on forms to be obtained from him at 16, Prince's Gate, S.W.7. The Advisory Committee in all Sections meet half-yearly, in April and October.

LECTURE PROGRAMME

Saturday, July 17th, 3 p.m.
Meeting arranged by the Miniature Camera Group. "A Talk on Making the Finished Print." By R. H. Mason, A.R.P.S.

Saturday, August 7th. A Visit to the Film Studios at Denham. Arranged by A. W. Watkins.

EXHIBITIONS AT PRINCE'S GATE

Friday, June 4th, to Saturday, July 31st. Prints of Spanish Cathedrals and Churches, by J. R. H. Weaver, M.A., President, Trinity College, Oxford; American Office of War Information. "California," by Edward Weston.

Monday, July 5th, to Saturday, July 31st. Prize Competition Prints by Readers of *The Amateur Photographer*.

Saturday, September 4th, to Saturday, October 23rd. The R.P.S. Annual Exhibition.

Final receiving day, Saturday, July 24th.

R.P.S. MEMBERSHIP

In order to stimulate a more direct interest in the activities of the R.P.S. among members of affiliated societies, and at the same time to afford officials an incentive to benefit the financial position of their own societies, the Council of The Royal Photographic Society offers a special rebate of 25 per cent of the first year's subscription of each member of an affiliated society who joins the R.P.S.

The primary object of membership is to assist the Council in furthering the advancement of photography, but there are many privileges incidental to membership, including the receipt of a copy of this *Journal* immediately upon publication each month.

The Associateship and Fellowship will naturally interest those who have progressed in the art or science of photography. These are coveted distinctions, and are accepted universally as evidence of genuine photographic ability.

The entrance fee of one guinea is already waived to members of affiliated societies, and the amount of the rebate to the societies to which the new members belong will therefore be 10s. 6d. in each instance.

Secretaries of affiliated societies are invited to give their careful attention to this scheme and to co-operate in making it successful. The Secretary of The Royal Photographic Society will be glad to give them further particulars and to furnish copies of the Society's prospectus or to communicate direct with prospective members if they will furnish their names and addresses.

THE PHOTOGRAPHIC JOURNAL

THE OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND
THE PHOTOGRAPHIC ALLIANCE

HONORARY ADVISORY EDITORS.—*Scientific and Technical Section*: C. WALLER, M.Sc., A.I.C., F.R.P.S.
Literary Section: J. DUDLEY JOHNSTON, HON. F.R.P.S. *Kinematograph Section*: ARTHUR S. NEWMAN, HON. F.R.P.S.
EDITOR: H. H. BLACKLOCK, F.R.P.S.

VOLUME
XXXIII

AUGUST, 1943

TWO SHILLINGS
AND SIXPENCE



SANTIAGO DE COMPOSTELA. South Transept Doorway, "Puerta de las Platerías"

*Circa 1100. Sculpture (re-arranged) of late 11th and early 12th centuries
From the Exhibition, "Spanish Architecture," by J. R. H. Weaver, M.A., F.R.P.S.*



John Barrymore, Jr.

TEN YEARS WITH A CONTAX

By Lancelot Vining, F.R.P.S.

A meeting of The Royal Photographic Society, arranged by the Pictorial Group, was held on Saturday afternoon, March 6th, 1943, at the Society's premises, at 16, Prince's Gate, S.W.7, when Mr. Lancelot Vining, F.R.P.S., lectured on "Ten Years with a Contax."

The President, Mr. D. McMaster, Hon. F.R.P.S., was in the chair.

The PRESIDENT, in opening the meeting, said that there were one or two occasions in the year to which a great many members looked forward. The speaker that afternoon was not only one of the pioneers in the use of the miniature camera and miniature film, but was one of the most discerning and discriminating photographers in the ranks of the Press. He had had a distinguished career as a newspaper photographer, and was recently responsible for the production and presentation of *The Daily Mirror's* exhibition of very large photographs, called "Allies in Action."

MR. LANCELOT VINING said: I am just one of the numerous 35 mm. camera users in this country with no claim to being more skilled or more advanced in pictorial taste than the others. Being a worker in Fleet Street, I may have had more and better opportunities, and that means more pictures of more interesting subjects than the average amateur ever has a chance of taking, but this does not signify that I have a better technique. Thanks to the

almost daily use of my camera, I may be more accustomed to handling my Contax than some of the other 35 mm. camera users, but this is no guarantee that my technical habits are even sound, in fact, I know that they would shock many of you.

When it comes to giving a talk, I am heavily handicapped by three factors. Firstly, I have been writing and illustrating a page in the *Amateur Photographer* each week for the past six years, and this totals up to 700

columns and 500 pictures. Secondly, my book, "My Way With the Miniature," was published in December, 1941. This contains 60,000 words and 100 photographs, and is now in its third edition. Thirdly, since the war nothing new has appeared in the "35" world: we have the same cameras, films, developers and grain.

As a result, I am not going to talk about any of these things, but to take a new angle, rather a personal one, which I think will be more interesting. There are three heads:

- (1) Why I went "35."
- (2) What "35" has done for my photography.
- (3) Conclusions reached.

All these are quite brief.

I know that in some quarters I am known as the "35" fanatic, but I do not mind this. I may be one, but what I want to make quite clear is that I did not go over to "35" without having had plenty of experience with larger cameras of many sizes, and more varied experience perhaps than the majority of photographers ever have a chance of gaining.

My work with the larger cameras covered a period of twenty-one years—1894 to 1915—ten years as an amateur, and eleven in Fleet Street, the street that never rests or sleeps.

During my twenty-one years I worked at some time or another with block-note, V.P.K., quarter-plate, 9 by 12 cm., 5 by 4, half-plate, and whole-plate.

The lenses used with these cameras varied between 2 inches and 60 inches; this latter giant was operated in a specially built half-plate coffin-shaped camera of great weight, which required two people to move about and operate, and I can assure you that a day out with it was no joy ride.

The cameras and lenses were all well-known makes, and I have used every type of gear connected with them in the production of pictures.

If you went to Fleet Street for a report on my work during these early years, I think you would find that I was up to a good average; reliable, but very little else.

During 1913 I began to lose interest in photography, the centre of my interest changing to art editing and the production of illustrated papers. I changed over to the art bench in 1915, and from then until 1936 produced the picture pages of *The Daily Mirror*, except for two periods when I was away from Fleet Street in the Royal Flying Corps and in America. These breaks enabled me to add aerial cameras and the American 5 by 4 press cameras to the list of others which I have used.



When the Girls are on Parade

ing 1930, whilst art editing *aily Mirror*, I began to notice a pe of picture coming in from itinent. The prints were often ainy, but the freshness of the balanced this. These prints y first introduction to Leica and they aroused an interest eras which had been dead for en years—a very long time. urn to photography after such hy break required great faith camera I had in view, faith in and a certain amount of regarding the future, which, of at a later date might prove to e wrong. I watched the rapid ement in "35" work, and this d any doubts I held with to its future, and I was soon hick of it.

34 I obtained my Contax and, o-day, I am still being asked preferred it to the (at that much advertised Leica. My chief reasons were, and still (a) I prefer the Zeiss optical ent; (b) I wanted at that use the plate back and dark I liked to be able to remove ck for cleaning and shutter ion; (c) I prefer wheel focus-lever. However, I did not until I had weighed up the ive merits of the two cameras. m up, I would say that I went ecause I believed that I had the camera which in the past amt about but never expected t. A camera which carried on raphy from where the $f/4.5$ ft off, and, as a result, new ere waiting to be explored and ictures produced. I also

believed that it was nearer perfection than any I had used in the past, and was also nearer to being universal.

What has the 35 mm. camera done for my photography? I feel that I ought to disclose the fact that when I changed to the art bench in 1915 I had an idea that I might be able to regain an interest in photography if I bought a quarter-plate camera and went in for real pictures and exhibition work. The N. and G. Sybil was my choice. But it was not to be. A few months proved me to be a dismal failure. I realized that I had not an artistic idea in my make-up; I could not get away from the news angle.

What happened eighteen years later when I started using a Contax may sound like a fairy story, and I find it all very difficult to explain. My photogra hic interest returned 100 per cent, and increased with every expo sure made. As soon as I took up 35 mm. work I joined the "Royal," and I must own that it was not because I thought it would do me much good, but because Jimmie Jarché assured me that it was the correct thing to do. Jarché and myself at that time were the only two in Fleet Street using "35" daily for all work. He used

a Leica, had joined the "Royal," obtained the A.R.P.S., and had lectured at Russell Square. I felt that I could not let the Leica get away with that, therefore I joined the "Royal," obtained the Associateship, and was invited to give a talk at Russell Square.

These events occurred in a very short space of time after I had started 35 mm. work, and I began to wonder if I should be able to live up to them. Having been away from photography for so long, that first talk at Russell Square caused me endless worry and a few sleepless nights. I need not have worried as the audience was very kind, and as the meeting dispersed, a member—Mr. W. G. Briggs—advised me to send a print of "Ice Ballet" to the Salon. I did so, although I felt at the time that there was a very big difference between photographs for the illustrated press and those for the aristocrats of the "Royal" and the Salon. However, it was accepted, and in case "beginner's luck" comes into your mind I had better mention that I have had one or more accepted by the "Royal" or Salon Exhibitions each year ever since.

My Salon success so soon after taking up 35 mm. work is not exceptional. During the past three months I have received two letters from readers of the *Amateur Photographer* telling me the same story and thanking me for giving them a lead. After years of trying to make the



The End of the Ice Cream Cone



Rhythm in Ballet

exhibition grade with larger cameras, and failing, they had both gone "35" and each had had a print in the 1942 Salon.

From the time I began to use the 35 mm. camera, assignments came to me almost weekly from the illustrated papers and monthly magazines (photographic and otherwise) for articles and photographs about the new subjects this new-sized camera was making possible. My "Gossip" page for the *Amateur Photographer* started on the invitation of the editor in 1936 and has not missed a single publication since. This feature has made hundreds of photographic friends for me all over the world, and for this reason alone I would hate to give it up.

The next surprise was caused by the Institute of British Photographers, of which I was not a member, when I was asked if I would sit on the qualifying Board dealing with Associateships and Fellowships. Jarché and myself had

been elected to deal with press and 35 mm. work. The ballot had been in secret, and election carried a Founder Fellowship.

My book was not directly my idea. Focal Press asked me to do a handbook on synchronized flashlight work. I refused because I thought that 1941 was no time for books, bombing was in full swing. Also there were no more bulbs in the country and very few "guns"—no new ones, and the English Burvin was not in manufacture. I concluded the interview by saying—quite as a joke—I would rather write a book on 35 mm. photography. It was a silly remark to make as I was taken up on it. A letter arrived the following day saying that a contract was being prepared for a book of 60,000 words and 100 photographs. This had me all worried and I hastened to a second interview. I explained that writing and illustrating weekly for six years would mean that the book would be nothing more than a re-hash. My

arguments were of no avail; I knew all the answers.

For the past four years I have been invited to act as one of the judges of Class VI for the annual Exhibition, but my latest refusal and the one I value most is the Fellowship of this Society.

I have not mentioned any of the events in a bragging spirit, but I can chronicle what has happened since I started working with a Contax. I did go after the Associateship Fellowship, but all the rest of the pleasant things which happened to me be credited, directly or indirectly, to 35 mm. photography.

It would be quite impossible to use a Contax almost daily for a long time and not form conclusions; but, of course, are entirely personal and in no way official. The "35" is a small addition to the already large family of cameras, and it does not displace any size at present. Whilst it can cope with all the subjects, it can also deal with subjects which are quite beyond the range of the larger cameras, and come to stay. In fact, it has proved its worth and is doing war work.

Any success I may have had is due down to the fact that I work on subjects made possible by the Contax aperture lens with its great range of focus, mostly worked in the region between $f/1.5$ and $f/16$. As a result, my pictures were different, and I was almost independent of light and weather. Given the camera a severe test over the past seven years, as all has been done in connection with Fleet Street, which is a hard job, but a fair master if you know your expenses low and your work lower. Photographing to order often with a time limit, different from the photographic know, and if you have never experienced this you have missed an opinion—the most interesting and exacting branch of photography. The Contax has never failed me, I feel that I often fail the camera.

I believe this camera will play a part in post-war photography with its bigger relations. The country is to hold its present position in the photographic world will need a strong body of workers to compete with workers on the Continent and America. I feel so strongly about this that I have recently started a group called "The Thirty-five" which we have been very lucky in joining with the Camera Club at Grosvenor Street. Our membership is 250 strong, and if enthusiastic for anything you will be convinced.

is in the future. It seems that when we have won great changes will take place, lives will be changed in many and photography will not

November issue of an American put into words my ideas pictures of the future, as "Salon prints need not be pretty pictures. They should be pictures of life, recorded with the truth, and the fullness of photography possesses." It still be portraits, land and nudes and still life, but not numbers we have to-day. The future will have a story. If all photographers in all would work to this end, and if their work was circulated in the international exhibition might all get to know more of each other—our lives, our customs—which help to put an end to the ignorance which existed in war.

What did surprise me when I started 35 mm. work was the feeling against the camera in many quarters. Many photographers made no secret of the fact that they considered it a toy because of its small size, and the fact that it had no rising front, but it was quite usual to find that they had formed this opinion without using a 35 mm. camera, exposing a film, or processing one. They knew all there was to know by intuition. The "no rising front" bogey is about the weakest objection it is possible to raise. If we knew the number of photographs taken during any one day I think we should find that the percentage which required the use of a rising front would be very small. Another type of objector is the humorist who says: "What amuses me about you miniature fiends is the amount of gear you have to carry about." He waves his arms round in large circles, indicating something about the size of a large packing case. My fitted case measures 13 inches by 10 inches by four

inches and contains the whole of my "35" outfit, a camera body, eight lenses, five filters, four viewfinders, unipod and universal head, and film for 500 exposures. Although there is only one camera body, it forms the base for a series of cameras: normal, wide angle, long focus, and copying. It contains all the gear necessary for working as close as 8 inches to any reasonable distance. It forms a new system of photography. My comic friend is not easily disposed of, and asks: "But what about your flash and photoflood lamps, leads and strands?" He pretends that he does not know that these are for use with any camera and are not exclusive to the 35 mm. The fact is that the "35" worker rarely has to resort to these accessories.

There is a much more serious attacker of whom, to date, I have only met one. He was an *Amateur Photographer* reader, and a civil servant. Whenever I mentioned a person in my notes or captions, and gave any clues as to address, he at once sent them a post card asking if I had made it quite clear that I was using a German camera for which I had sent a large sum of money to Germany, and which was now being returned to this country in the shape of bombs for the murder of our women and children. He became such a pest that I warned him I was sending his letters and post cards to my solicitor. By return of post he wrote to me asking to be forgiven, because, as a civil servant, a court action would be his ruin. Here is the most interesting part of his letter:—

"Since then I have come to realize that my German camera prejudice comes from the fact that I cannot afford one on a postman's wage, and I do feel, and I know many others do, that we are sort of being pushed out and left behind."

When we consider that each of the three fighting services, together with medical, dental and scientific institutions, engineering and munitions works, banks, insurance houses, and businesses of every description are using the 35 mm. camera, we can take it for certain that the scoffers are advertising their camera ignorance or suffering from a severe dose of sour grapes.

A great many people seem to think that the 35 mm. camera was produced to act as a label indicating the vulgar wealth of the owner, but it is the natural outcome of the production of perfect 35 mm. film. In 1913 Oskar Barnack realized that a still camera for this film would have a great future as it would be possible to use interchangeable large aperture lenses



At the London Casino



Elizabeth Henning poses for Doreen Sinclair

giving great depth of focus. Three things were required: (1) the finest possible optical equipment; (2) a perfect rangefinder; (3) a perfect film track. The camera to be precision made. These three features are of equal importance and if one of them fails to come up to the highest standard, then the other two are wasted. The small size and light weight are not the cause of more and more photographers tending to use the 35 mm. camera exclusively, whether pictorialists, scientists, sportsmen, artists, newspapermen, or amateurs. Neither can we put the revolutionary change which has come over photography since the arrival of the 35 mm. camera down to mere fashion. I think we must give most credit to the short-focus lenses and the use of 35 mm. cine film as negative material.

The normal focus lens for the Contax or Leica is two inches. Compare this with a six-inch lens, both at $f/3.5$. Focused at three feet the two-inch gives a depth of six inches against one-and-a-half inches by the six-inch lens. At ten feet the two-inch gives fifty-two inches against seventeen inches by the six-inch, whilst at thirty-two feet the two-inch gives

998 inches against 186 inches with the six-inch.

The photographic world was naturally startled when in 1932 Carl Zeiss brought out an $f/1.5$ lens which had a depth of focus at this aperture equal to a six-inch lens stopped down to $f/4.5$ and an $f/2$ lens with a depth at full aperture equal to a six-inch lens stopped down to $f/5.6$. For the same depth of focus, these 35 mm. lenses allow between eight and nine times the amount of light to reach the film.

I suggested the film as the second reason. The size is useful as in peacetime it can be obtained everywhere in a variety of emulsions, but its chief claim is that it is used without the usual paper backing, thus saving the wave and cockle on the focal plane which is obtained with the larger films, and which destroys any chance of sharp results over the entire surface of the film when using a large aperture.

These conclusions and views on the 35 mm. camera are entirely personal. The future may prove that the past ten years have misled me; if this should happen I shall still have no regrets at having owned and worked with a Contax, the camera which will

have given me my happiest graphic memories.

Before showing my slides, cover the past ten years and my first 35 mm. photographs recent ones, I should like to raise two points about 35 mm. technique to which I try to stick. In 35 mm. work the greatest chance must be attached to the location of the camera to the subject. I know this applies to all cameras but with the "35" there is a difference. Owing to the small size of the negative there must be no wasting of space. With larger negatives you can leave a fair margin for safe cropping once you start leaving was around the subject so as to be sure that it is all in, then you are on a downward path so far as 35 mm. work is concerned.

Coupled with the application of the camera must come correct exposure. This is important, because no corrections can be made during processing which can be termed automatic, which is carried out without attention. Many new 35 mm. cameras have a tendency to make a mess of weather of processing, which is wrong. All you can do is to be sure for the correct time, at the correct temperature, fix, harden and so on. The aim must be to produce correct exposed negatives, correcting small mistakes with different grades of paper when enlarging.

Mr. Vining then showed near slides illustrating his work.

Discussion

Asked if he did not think that the 35 mm. camera would not be a combination of a moving and still camera, Mr. Vining was under the impression that the combination of moving and still camera was the aim.

Another member said that the 35 mm. camera was everything which could be desired in the hands of the expert worker, but it was not the camera advocated for those beginning photography.

Mr. Vining replied that when people asked if he advised them to go in for 35 mm. he said "No," because he knew nothing about it, his ideas or what he could do in photography. If a person did not know what to do, he should go miniature, but had to get so small a person to advise him, he should keep larger sizes. If someone said, "I want to do miniature work, I have never had before," his advice was to get hold of a camera with some slow plates, go down to a dark room and see what happened, a photograph that way, the miniature would come later.

The CHAIRMAN proposed a very hearty vote of thanks to Mr. Vining for his lecture, not wasted one word of his story, and it had been interesting, concise and he voted of thanks was accorded by acclamation.



seen from under water

Anthony Peacock, F.R.P.S.

LIGHTING FOR FIGURE STUDIES OUTDOORS AND INDOORS

By Anthony Peacock, F.R.P.S.

At a joint meeting of The Royal Photographic Society and the Leicester and Leicestershire Photographic Society, held at the headquarters of the latter, at Waterloo Hall, Waterloo Street, Leicester, on March 2nd, 1943, Mr. Anthony Peacock, F.R.P.S., read on "Lighting for Figure Studies—Outdoors and Indoors." President of the Leicester and Leicestershire Photographic Society, Mr. G. C. Bent, was in the chair.

FROM the beginning of time, light has always been a source of wonder and the first consideration of mankind. In the story of the creation we are told that the first thing the Almighty created was light. The first gesture of a baby is always be towards the light. A flower or a flower will naturally turn towards it. Small wonder that some of the things worshipped it. Its importance to the photographer needs no emphasis on my part. Photography is merely an arrangement of light and shade. In that interesting story which Mr. Vial gave us early in the evening, he described composition as scaffolding in the building of the picture. I should describe light as only the foundation, but the most important part of the structure. Daguerre, that

early pioneer, was the first to describe photography as "painting with light." (He was himself an artist).

I want to-night to give you some thoughts and put forward some suggestions for its use and application. Although I refer the whole time to the nude, I have no doubt that many of my remarks apply equally to general portraiture. I am afraid that some of the slides you will see this evening were shown here last year when I illustrated a talk on posing the human figure. I have some new ones, but those which have been seen before will perhaps be viewed from a different lighting, not a posing point of view, and thereby take on somewhat of a new aspect.

My first ventures into the realms of nude photography were out of doors and most of my activities have been in that direction. I propose,

therefore, to deal with this side of the subject first. Besides, the first type of illumination used in photography was the sun. It is fitting, therefore, to take it first. It remains to-day probably the finest source of photographic light, in spite of all modern inventions and complex combinations of artificial light which are available to the studio worker. There are, though, various problems which arise when working outside which do not concern us indoors.

Inside, the various lighting units, however many and complex they are, are all capable of being controlled. The sun itself, on the other hand, cannot be controlled—that is, no one since Joshua has been successful!

Then there are backgrounds. In the studio they can be created and altered at will, but outside this is not possible. I shall try to show you later what an important part light plays in their choice.

So far as the control of light is concerned, the sunshine is there and we must take it or leave it. It is up to the photographer to adapt it for his use and take advantage of the illumination of the moment. He must, in other words, be an opportunist. I say the illumination of the moment, because the sun varies so much in power, intensity, angle and quality throughout the day. During that part of the year (from May to September) when figure work outside is possible, the active rays of the sun increase in intensity to an enormous extent, from dawn to midday as much as 50,000 times, I am told. It continues to increase day by day until the summer sun reaches its zenith, when, of course, it starts to recede again. The variations in contrast between the shadow and the light area in our picture during this period are also equally great. This variation in power is obviously effected by the elevation or change in angle of the sun, or, in other words, the height the sun is in the heavens. During the early morning or late evening, when the sun is low, its power is correspondingly slight, owing to the diffusing effect of the atmosphere. When the sun goes "in," shadows disappear and the light not only loses its directional quality, but contrast is also reduced to a minimum. All this means that the softness or harshness of the light varies according to the atmosphere and time of the day.

Reflection is another thing that affects the quality of the light. Ordinarily at midday in the summer, the light is inclined to be too harsh, but on the beach or near water, reflection relieves the density of the shadows and makes some nice

modelling possible. Artificial reflectors, such as a book on the ground or a piece of white cloth thrown over a bush, can be used. Personally, I prefer, however, to make use of the reflective qualities of the natural elements whenever possible.

The angle that the light strikes the subject is also obviously dependent on the position of the camera. By moving to the right or to the left, the angle of illumination with relation to the camera is altered accordingly. Talking of direction of the light, there are still some people who continue to believe in the old-fashioned idea that good pictures are only possible when the sun is behind the camera. In actual fact, this is the one direction that should be avoided at all costs. The sun may be directly in the eyes of the model and cause her to close her eyes, wrinkle her face and squint badly according to the strength of the light. Also, the resulting picture will be extremely flat, uninteresting and lacking in contrast. There is a good motto which says that "*long shadows make interesting pictures.*" When the sun is behind the camera there are few, if any, shadows, and it is the shadows or contrast of light and shade that make the resulting picture more stereoscopic. Choose a setting, therefore, that has the light coming from one side, and the shadows will emphasise and bring out the details of the picture.

When viewing a print, the eye of the beholder travels over its surface and should be automatically attracted to the central point of interest. The figure, being that centre of interest, must be emphasized accordingly—especially out of doors. Any picture where the figure and the background claim equal interest is always a poor picture. The figure should unmistakably predominate. Choose beautiful scenery by all means, but however lovely, be sure that it is subordinate to the figure in the foreground.

There are several methods of achieving this emphasis and drawing attention to the figure, but the light method is quite the most satisfactory. The strongest interest should be in the strongest part of the light. The model, being the strongest interest, should generally, therefore, be in the strongest light. From experience I find that backlighting, although only one method, is quite the best for this purpose. It throws a halo round the head and hair, in fact, the whole figure is outlined in light and stands out strongly from the background. I said earlier that long shadows make interesting pictures. With oncoming light they give an impression of depth and distance which are extremely valuable assets in any

composition. Another advantage is that the model is spared the possible glare of light in her eyes: the ancient curse of outdoor portraiture. It creates many surprisingly beautiful effects. The duller of spots and the plainest of trees gain a new and unexpected beauty. The delicacy of Nature is itself enhanced. I do not mean to suggest that against the light photography is the sole key to successful figure work—it is not. It is just one method of emphasizing the figure and enhancing beauty. It has its disadvantages and difficulties.

Exposure, for example, must be considerably lengthened to compensate for the density of the shadows. If any depth of focus is required at the same time, the model may have to hold a pose longer than normal. A forced look is then apt to enter into the picture and spontaneity will be lost. I do not suggest that outdoor pictures should be spontaneous, but it is invariably better if they appear spontaneous. I spoke of reflection affecting the quality of light. With oncoming light some form of reflector, either natural or artificial, is often essential, especially in the morning or evening when the sun is low and not overhead. On such an occasion the reflector will lighten the shadows and overcome the danger of a silhouette effect. On the other hand, care must be taken when the sun is overhead, as the camera, anyhow, rather tends to exaggerate size and weight in the human figure, especially in the bust; with a strong top light and no reflector the result is unfortunate.

I have spoken so far almost entirely of against-the-sun pictures casting a strong shadow towards the camera. When, however, there are no cast shadows and the light is flat with little gradation through modelling pictorial interest and contrast must

be supplied entirely by the model herself. Choose a female rather than a male subject on such an occasion. A brunette will make a better picture than a blonde, who is best portrayed in sunshine. The whole figure rather than a part. A male calls for more excitement and contrast in the lighting. Strong, active poses rather than passive delicate curves and gestures.

Of all the things that conspire to spoil a picture, a bad background quite easily tops the list. Many people seem to have a sort of background blindness. Their whole attention is directed on the figure and they forget what is behind. The result is branches growing weirdly from the model's head or side. I think we have all tried to take a picture of Aunt Emily on the lawn with the house on the background—the result turns out to be merely a picture of the house standing behind Aunt Emily!

A confused background caused by weird patterns of light and shade should be avoided. With foliage, and especially with oncoming light, this is a particular danger. Many pictures are spoilt by shadows from the background falling across the figure and making disturbing patterns on the body. The subtle rhythm in the curves of the figure is lost, and an irrelevant pattern created completely at variance with the pattern of the body.

About the commonest of all faults so far as backgrounds are concerned are those annoying blobs of light that appear through the foliage when the background is out of focus. At any time, foliage backgrounds must be chosen with care—it is so easy to include patches of light (or light traps) which will irresistibly draw and hold the attention away from the figure.

It is also a mistake to attempt pictures in the shade of trees where there are bright patches of light beyond. The result is a background of violent contrast with the model subordinate in the front of the picture.

Take care that the beauty of foliage sparkling in the sunshine does not result merely in a fussy and confused background. Such things are a menace to the success of any picture. It is a good idea to view a scene through a blue filter; not only does it reduce the colour of the scene more to a monochrome standard, but excessive contrast is revealed.

The seashore is an excellent setting for outdoor pictures of the nude. The light is bright, with ample reflection from the sand and water, whereas backgrounds are simple and free from



The Oarsman Anthony Peacock, F.R.P.S.

ing factors. Simplicity is, in good keynote to bear in mind or out.

Implicitly should even include the set-up of the model. Whereas sophisticated and even exaggerated make-up may be quite outside it would be out of order and foolish. Orthochromatic film sensitive to green and weak to red, will tend to darken the colour of the lips and eyes. Pan film, on the other hand, sensitive to red, and therefore gives a weak rendering of the lips. With pan film, therefore, is really to be recommended. As the body is concerned, a smudge of cold cream is all that is necessary. It brings out the gloss of the skin and slightly emphasizes the highlights. No make-up, however, entirely obliterate suit marks which spoil any nude pictures.

There are so many different methods of indoor or studio lighting that it is quite impossible this time to discuss or even describe them. I have a few of my own here this evening and will try to describe the methods I have adopted in using them. I am also able to show a few examples kindly loaned by that well-known worker, Herbert, F.R.P.S. Some of these will be recognized by you, as they will anyhow have been productions of those of his shown at the "Royal" in the

not for a moment claim that shadow is better than any other. I say, however, that for my taste and speciality, I find the method that I use to be the most satisfactory. I have particular stress on the importance of the background in the picture. It is of even greater importance in the more confined space of the studio. In both cases light from the background can mar the picture. The note will be much louder, in the studio. An object may be unobtrusive out of doors, but if it is not a part of the theme of the picture, it will be very distracting. A shadow across the background can so appear distorted, out of shape, and unattractive. I aim, therefore, at a plain shadow-free background, either light or dark in

absence of shadow can best be achieved by illuminating the background quite separately from the subject which is posed some distance



The Silent Pool Anthony Peacock, F.R.P.S.

away in front of it. By shadow free background, I do not mean shadowless photography. Shadowless photography can best be described as a two-dimensional effect with the minimum of contrast, and no cast shadows to assist in modelling—for example, a high key picture. To obtain such an effect, the background would still be lit separately to the model who would still remain posed some distance in front of it. The front lighting unit would, however, be a flood placed as near the lens as was possible. By shadow free I mean nothing more than the removal or entire absence of all shadow from the background. A piece of black silk velvet, which is about the most light absorbent surface known, will, of course, cut out all shadows. Such a background, however, does not quite fit in with the beauty and delicacy of the female figure, apart from being unable to get such things. It is too heavy, in my opinion. There are, however, many difficulties with the light background. Shadows from the model often persist in spite of separate illumination, which in itself is difficult to achieve without lighting the subject at the same time.

It is best, therefore, to pose the model as far as reasonably possible from the background. If the figure is then lit more from the side, the shadow will be excluded from the picture space behind the model. A certain amount of shadow is, of course, essential to convey warmth and expression. Life and individuality cannot be portrayed without it.

A sitting, so far as the model is concerned, should be well thought out beforehand and conducted in a fairly rapid tempo—both model and photographer being carried along on a

wave of mutual enthusiasm. Haphazard snapping without preconceived ideas is a waste of material and gets nowhere. The lighting, in the same way, should be used in a considered order. The first light to receive attention will be that illuminating the background. The general idea of the pose is then "roughed in" and the main basic light source tried out. This lamp will invariably be a flood to emphasize the roundness and delicate lines of the body. Shadows will have to be observed to ensure that no weird patterns are created within the picture space. Supplementary lighting can now be brought into use. This may be a spot light to emphasize a certain part of the body, or a top light to illuminate the hair. A white or even a black reflector may be wanted to add tone to an area. Many are the possibilities of this combination. The main source of light can even be a top light, both with and without an illuminated background; the "fill in" light being from the front by the camera.

When an illuminated shadow-free background is used, the tone of the body can be made darker or lighter as desired, according to the distance this front lamp is from the subject. When right back by the camera and diffused, a dark semi-silhouette effect results. The closer to the model the lamp is brought, obviously, the lighter the tone. If brought close enough, the tone of the body will match the light area of the background. This is not necessarily a high key effect. True high key pictures cannot be made without a high key subject. They are generally produced by shadowless lighting described earlier.

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Interesting Problems

Finally, I have one or two slides taken at Loughborough College. The taking of them produced many interesting problems as regards light. They all portray swimmers actually under water—the top of the water being at the top of the picture. To give sufficient light, I built a bank of four floodlights and mounted them in one reflector. At first, this was suspended close down over the water. The result, however, was not satisfactory. More than 90 per cent of the light was reflected and failed to penetrate the surface at all. All these pictures were taken with the same four floods shining through an observation window on the left. They are all taken on Super XX 1/5.6 1/25th sec. exposure. The illusion of distance when viewed under water was interesting. The eye was deceived and grossly underestimated.



Steps

GUM BICHROMATE: Multiple Printing SOME RECENT EXPERIMENTS

By George Halford, A.R.C.A., F.R.P.S.

At a Joint Meeting of the Bradford Photographic Society and The Royal Photographic Society, held on 13th February, 1943, at the Mechanics' Institute, Bradford, Mr. George Halford, A.R.C.A., F.R.P.S., gave an interesting lecture-demonstration on the Gum Bichromate process with special reference to recent experiments he had been conducting in multiple printing.

Mr. N. A. Scurrah, A.R.P.S., President of the Bradford Photographic Society, presided, and, in introducing the lecturer, remarked that neither Mr. Halford nor "Gum" were strangers to Bradford. Mr. Halford was one of our most valued members, and the latter had been associated with Bradford for many years through the world-wide reputation of Mr. J. Harold Leighton, F.R.P.S., from whom he believed Mr. Halford had received much valuable advice and assistance in his early "Gum" days.

IN these times of profound economic disturbance, it is surprising that more photographers have not taken up Gum Bichromate Printing, especially in face of the scarcity of bromide and other printing papers. How many photographers know that

Introduction you can take a piece of drawing paper, paint it with what is virtually water-colour, expose to daylight under a negative, develop in water and produce a beautiful permanent photographic print in any colour? Yet, this is true. The ingredients are cheap and last a long time. The stock contains no deteriorating substance, and the paper only becomes sensitive to light after the

final drying. These virtues are particularly valuable in time of war.

There are two marked disadvantages appertaining to the process:—

1. A full-size negative is needed.
2. Owing to the low sensitivity of the emulsion, either
 - (a) Daylight, or
 - (b) A Mercury Vapour Lamp is required.

History

The process was invented by Pouncy in 1858, at a time when clear, sharp prints were in vogue, but it does not seem to have appealed to many workers. It first came to general notice about 1894, when Demachy, Maskell, Puyo and others took it up. The freedom and variety

of treatment which it offered at that date to be more appreciated. However, it gave way later to processes capable of printing by contact. In recent years there have been only one regular exponent in this process. It is to Mr. Leighton, F.R.P.S., that the workers are indebted for both inspiration and their knowledge.

Basic Principle

The process only became popular when it was discovered that if you mix a solution of gum with a solution of bichromate, and expose to light, the gum becomes insoluble proportionate to the amount of light that reaches the mixture. It is upon this fact that the process depends. The sensitive paper is to commence with. The darkest parts are fixed by light passing through the thinnest parts of the negative. The unwanted emulsion is dissolved away in water at room temperature.

Single Print Process

As this process tends to produce the tones presented, the composition should be of strong, well-defined areas. The negative should be strong (as given by "ordinary" but not as contrasty as given by "process" plates). If the tone values is short, no difficulty will be experienced in printing. Well familiar with prints by Mr. Leighton, which have demonstrated the process so indisputably and shown how beautiful process this is.

Multiple Printing

Whilst the single print process gives perfectly satisfactory prints from suitable negatives, the question naturally arises as to whether the method of obtaining prints from the advocates of the single print process would call an unlimited negative, i.e., negatives full of detail but having very thin shadows and very dense high-light areas.

A fact which gave food for thought was that whilst Mr. Leighton had used a fairly plucky negative in the single print process, the advocates of the single print process would call an unlimited negative, i.e., negatives full of detail but having very thin shadows and very dense high-light areas.

Starting with a negative with shadow detail and dense high-light areas it is possible to:—

- (a) Print the shadow detail, leaving most of the print white.
 - (b) Print the high-light detail, leaving very long exposure, leaving other parts choked up.
- At the tone of maximum detail under control, the choking

shadow detail can be done in grey (instead of black). This can be done without harm to the darker parts of the high-light areas, which do not call upon the full black tone values of which the process is capable.

After the first printing for high-light detail, the developed print is allowed to become bone dry. This fixes it. The first printing will not now be affected by any subsequent re-coating. The print is then re-emulsified, exposed for a short time for shadow detail and developed in water. Having received a short exposure, the emulsion on the high-light portions is quickly dissolved away and does no harm. Development is continued until only the required amount of shadow detail is left and the shadow has itself ceased to feel "heavy."

In actual practice one should allow the development to go, what appears to be, a little too far.

Light for Printing

- (1) Daylight is satisfactory except that it is quantitatively unknown.
- (2) The author always uses mercury vapour (400 c.p.), so can control the exposure.

Technical Details

The final stages in making the print entitled "Via Sarrozzini" were demonstrated. The details of its production from the commencement were as follows:—

Stock Gum Solution

Gum arabic ... 5 ozs.
Water ... 9 ozs.
Carbolic acid 15 to 20 drops.

After dissolving at room temperature, sieve through muslin. It will keep. The author has used gum solution eight years old.

Some difficulty may be experienced in getting the gum to dissolve, but it

can be dissolved in about 36 hours in a warm room.

Paper

Joynson's cartridge paper. Soak for three minutes in a saturated solution of Potassium Bichromate. Dry.

The Emulsion

Stock gum solution 10 c.c.
Water ... approx. 8 c.c.
Drop black powder 1 gramme.

Mix thoroughly in mortar and pestle. Pin the paper over a larger piece of old newspaper so that you can sweep the brush over and beyond the paper you are coating. Coat the right side of the paper, using a hog-hair (or similar) brush, smoothing finally with a badger-hair brush. Hang up to dry in the darkroom. The coated paper becomes sensitive as it dries, and should not after this be exposed to daylight. The tone of the paper at this stage (even for the

single print process) is a dark brown, not black. The full tone value of the coat does not appear until development. The coating need not be as mechanically even as most people imagine. The paper is larger than required, and selection can be exercised when trimming to the size of the negative, which should be done at this stage.

First Exposure

For high-light detail: Sixty minutes at 12 inches from the mercury vapour lamp.

Development

Develop in water, preferably vertically, until the detail appears to have become a little too pale. Dry. Re-emulsify.

Soak the print in the saturated solution of potassium bichromate for three minutes. Dry. Re-coat as for the first printing. Dry.

Second Exposure

For shadow detail: place the print in correct register with the negative, and expose for 9 minutes at 12 inches from the mercury vapour lamp.

Development

Again develop fully, and dry. If the print still shows bichromate stain, this can be removed by immersing in a five per cent solution of potassium metabisulphite. The print is now ready for trimming and mounting.

Questions

1. Why have so many gum prints got a coarse grain?

It depends on the way you add the bichromate. There are two ways of introducing the bichromate into the mixture:—

1. By mixing it with the gum and pigment before coating.



Santa Maria della Salute



An absolutely straight print from one only negative and no local development

2. By soaking the paper first (as recommended) and allowing the gum and pigment mixture to dissolve the required amount of bichromate from the paper as it is being coated.



First printing

Graininess is a fault mostly encountered when using the first method. When an exposure is made, the particles furthest from the paper receive more exposure than those nearer to the paper, giving on development a more stable layer on top of a less stable one, which breaks away as development becomes complete.

By the second method the particles nearest to the paper are more sensitive than those further away, thus counteracting the above tendency. This theory is amply verified in practice.

2. How do you get perfect registration for the second printing?

Have tried many methods, including special registration points at the corners or along the edge, but have come back to a very simple and direct method. Make two "needle-point" holes in the print through two easily identified points dividing the print, say, into thirds. These should be on dark places in the print, otherwise you will have two minute but irremovable dark pin points on your final print. Place the print as near as possible in registration with the negative, holding close to an electric light with the print nearest the light. It will be found that the two pin holes show as bright lights and enable a final and exact placing to be made.



Via Sarozzi

3. What is the effect of hot water on development?

It shortens development but tends to introduce graininess in the print. Forced development under the tap also has the same effect.

4. How much black would you use for the single print process?

Increase from 1 gramme for double printing to, say, $1\frac{1}{2}$ grammes for single. However, the richest effects (and they are very rich) are by superimposing two 1 gramme coatings.

5. Can other papers be used?

Yes. Michallet is a good paper if no exception is taken to the vertical

lines that always show in this paper. Linen-fibre drawing papers do not seem so suitable. Suitability is chiefly a matter of sizing. Papers with too little size give dirty whites. With too much size, the result is hard con-



Second printing

trasty. If you are developing horizontally in dishes you require a paper that will float. Vertical development is recommended.

6. How long does development take?

Any time from fifteen minutes to four days. The general rule is—the longer the development takes, the better the quality of the print.

7. How do you retouch in this process?

Remove any parts that are darker than required, whilst the print is wet immediately after development. The emulsion is very tender, and the pigment is easy to remove. For parts to be darkened, mix the pigment into a paste with a mixture of the gum, to which has been added an equal quantity of glycerine. This makes a water-colour which exactly matches the print, and should, of course, be applied after the print is dry. The print has a good matt surface and presents no difficulties.

An appreciative vote of thanks was accorded to Mr. Halford by Mr. J. H. Leighton and Mr. J. P. Delaney. Mr. E. B. Johnson expressed the opinion that this afternoon's meeting was unique in that Mr. Halford had publicly demonstrated for the first time a method of gum bichromate multiple printing in which the factors were under the worker's control.



A very flat negative. An example of local development

The Late FREDERICK H. EVANS, Hon. F.R.P.S.

On 24th June, 1943, within a few days of his ninety-first birthday, died Frederick H. Evans, one of the most distinguished men who ever used photography as the medium of his artistic expression. He was equally accomplished in portraiture and landscape, and architecture was first and foremost his subject, and one is tempted to think that he well-nigh exhausted photographic possibilities. At any rate, Evans showed how architecture could be photographed, and did it to a pitch of excellence that provoked admiration, but never serious rivalry. Like Horsley Hinton, he used Platinotype almost exclusively, and exercised complete mastery over the process, which in his hands was the perfect medium for the delicate, ethereal effects in which he delighted.

Evans retired early, in 1898, at the age of 45, from a successful book-binding and publishing business in Fenchurch Street, E.C., and thereafter devoted himself to his artistic and literary interests, of which photography, music, and Japanese-print collecting were the chief. He visited many English and French cathedrals and abbeys, Wells, York, Chartres, and others perhaps the favourite ones—he photographed a number of such châteaux for *Country Life*, and, in 1910, a fine set of slides of Westminster Abbey, while it was closed in preparation for the coronation of King George V. All the time he was exhibiting regularly at the "Royal" and the Photographic Society, and contributing occasional articles to the photographic Press. He described his methods in a series of lectures in *The Amateur Photographer* in 1904, without revealing—because he could not—the secrets of his art, which lay in his eye for a fine subject, his sense of composition, perfect technique, and infinite capacity for taking risks. His enthusiasm was at once absorbing and infectious. Never satisfied, he was for ever devising and experimenting—a new type of camera, new brands of platinum paper, adaptations to his pianola, a machine for cutting his own music rolls; and when not at work, he liked nothing more than stimulating conversation about books, music, his experiences, and social questions.

Among his friends he counted, besides many leading photographers, William Morris, Aubrey Beardsley, Leonard Shaw, and J. M. Dent. It was Evans who helped Dent in his publishing ventures, who also attended the young Beardsley, in-



FREDERICK H. EVANS, Hon. F.R.P.S.

A portrait by J. R. H. Weaver, M.A., F.R.P.S.

introduced him to Dent, and thus set him on his short-lived career as an illustrator. He photographed Kelmscott Manor, and later (1909) made many of the photographic illustrations for the memorial edition of George Meredith's works. When, in his later years, architectural work with his 10in. by 8in. camera became too arduous, Evans took to photographic copying, making enlargements in "ivory-black" platinotype of Edward Calvert's woodcuts and Lützelberger's engravings of Holbein's "Dance of Death." But more

and more of his time he devoted to his beloved pianola, for which he was still cutting music on the last day of his life. A surprise visit paid him by the writer in October, 1942, (after the lapse of many years), found him still at work, and no perceptible failing of the alert spirit and vigorous mind of forty years ago.

Evans, who received the Honorary Fellowship of the Society in 1928, married in 1900, and leaves a widow, two sons and a daughter, to whom his many friends tender their sincere sympathy. J. R. H. WEAVER.

VARIGAM (A Variable Contrast Paper).

By Rowland S. Potter

A communication from the Research Laboratories of the Defender Photo Supply Company, Inc., Rochester, New York, U.S.A.

On May 21st, 1940, Mr. F. F. Renwick delivered a lecture before The Royal Photographic Society, introducing "Multi-grade" a New Printing Paper.

That lecture constituted the introductory preface to the communication describing a new type of variable contrast paper introduced in the United States of America by the Defender Photo Supply Company, Inc., of Rochester, New York.

While experimenting with emulsions made after the Mord manner (1), it was found that when a smaller quantity than normally used of a certain green sensitising dye was mixed with a bromo-chloride enlarging emulsion, such emulsion, when coated, had the unique property of giving softer gradation when exposed to light of wavelengths above 500 millimicrons than when exposed to blue light of wavelengths below 500 millimicrons.

It is well known that emulsions, especially those dye-sensitised, usually give somewhat higher gammas in the sensitised region and, in fact, vary slightly in gamma throughout their range of spectral sensitivity. The variation has always been slight and generally considered a defect to be eliminated if possible.

But here we had a two-fold, new phenomenon. Firstly, the gamma was lower in the region of conferred sensitivity, and, secondly, the difference in gamma was very large—of the order of at least 50 per cent. It is easily seen how this effect escaped discovery before, because it is not common to all sensitising dyes, and is only found under certain conditions to be detailed later.

A typical dye reacting in this way is 1:1 diethyl pseudo-cyanine iodide, (2). It is generally conceded that the gradation characteristics of an emulsion are largely, if not entirely, dependent on the range of speed (or sensitivity) values of the individual silver halide grains in that emulsion. Witness the experiments of Trivelli, Renwick, and many others. In any single emulsion the larger grains are more sensitive than the smaller ones, and it has been adequately shown, as might be expected, that the silver halide grains in emulsions of great contrast have a much smaller size range than in emulsions of softer gradation.

Let us now consider the effect of

sensitising dyes. In general, it is believed that these dyes are adsorbed on the surface of the silver halide crystals. Carroll and Hubbard proved in their work, published by the Bureau of Standards, that variation in the amount of sensitiser used within working limits, while it greatly affected the speed of the emulsion when exposed to light of the region of new spectral sensitivity, had no effect on the gamma or gradation.

Fig. 1 represents diagrammatically a typical series of silver halide crystals of an emulsion of rather high gamma.

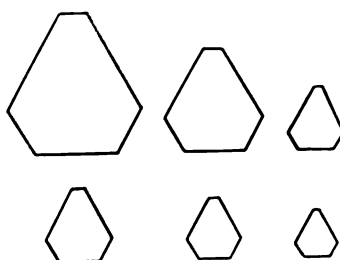


Fig. 1

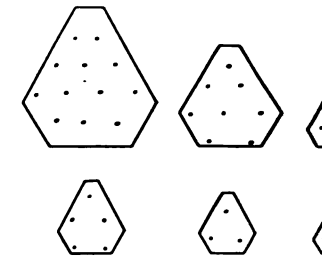


Fig. 2

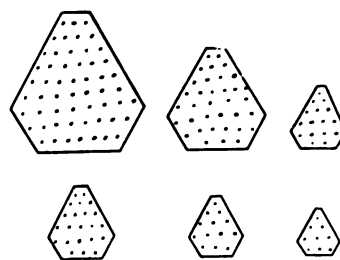


Fig. 3

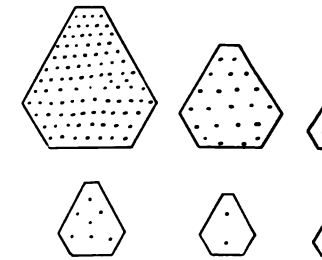


Fig. 4

Fig. 2 represents diagrammatically the result of the addition of a small amount of normal dye sensitiser, such as Pinachrome; the adsorbed dye particles are proportional to the crystal surface.

Fig. 3 represents larger additions of dye sensitiser; still the dye particles are adsorbed proportionately to the crystal surface. We would not expect to obtain a different gamma when such an emulsion was exposed to light of the region of conferred sensitivity compared to the gradation in the region of natural sensitivity.

However, if somehow more dye particles could be proportionately adsorbed on to the larger silver halide

crystals than on the smaller ones, in Fig. 4, we should obviously have a greater range of speed, and hence individual particles when exposed to the light of the spectral region which sensitivity is conferred by dye than when this same emulsion of particles were exposed to the light of the natural colour region. Hence, we should expect a gradation with such an emulsion when exposed to the conferred sensitivity region.

In 1924, Renwick & Sease (3) published a most interesting result

a new method of studying the relationship of the grain size to sensitivity in an emulsion. The method was of slow sedimentation of a butyrate emulsion gradually setting the layers without agitation, and testing chemical analysis the layers from different depths (the larger crystals naturally settling in lower layers), and correlating results with sensitometric evaluation of coatings from these layers.

This method of studying the characteristics of an emulsion was applied to a variable contrast emulsion prepared as outlined in the early part of this communication. Table I shows the results of such an experiment.



Print on Varigam paper through Medium Filter



Print on Varigam paper through Blue Filter



Print on Varigam paper through Yellow Filter

d shows that the larger particles (bottom layer) are about 70 per cent more colour sensitive than the smaller particles (columns 5, 6 and 7), confirming the above hypothesis. This shows clearly to indicate the reason for the variable contrast obtained when exposed to green and blue light.

(C) When the sensitising dye was added in full quantity to an emulsion just before setting and the excess dye removed by washing.

B and C would seem to indicate that this type of dye was slow in conferring sensitivity to the silver grain. In the light of the results of

In practice, the print contrast is most readily controlled by light filters; a blue filter gives hard contrast, and a yellow filter gives soft contrast. (Yellow filters are naturally preferred to green because of their greater optical efficiency, and the paper being insensitive to red).

Varigam paper is balanced to give equal exposure times through a series of ten filters giving progressive steps of contrast change when General Electric High Efficiency White Photo-Enlarger Bulbs are used.

There are two methods by which the character of the spectral transmission of filters can be changed.

Table I

SEDIMENTATION OF VARIGAM VARIABLE CONTRAST EMULSION

	Gamma		Speed (in arbitrary units)		Relative Speeds			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Green		Blue		Top to Bottom (Bottom as 100)			
Position of emulsion Used	Green	Blue	Green	Blue	Gr'n to Blue (Blue as 100)	Green	Blue	
Top	...	.52 1.30	.22	.304	70 100	2.2	3.7	
Bottom	...	2.14 2.2	9.8	8.2	120 100	100	100	

Experiments with suitable sensitising dyes showed that the effect of variable contrast was obtained (varying in degree considerably amongst dyes listed (2) :—

- When considerably less sensitising dye was used than necessary to give the maximum sensitivity obtainable by that dye,
- When a full quantity of sensitising dye was added to the emulsion immediately before coating, the variable contrast effect was obtained; but, held for some time (such as an hour at coating temperature), contrast was similar to both green and blue light,

the sedimentation experiment A, B and C would seem to indicate that the sensitising dye had a preference for the larger grains or crystals rather than the smaller ones.

Now, if a dye is slowly adsorbed to the silver halide crystals, it is legitimate to assume that its adsorption behaviour might follow the well-known laws first enunciated by Ostwald, concerning the more rapid growth of larger crystals than smaller crystals in saturated solutions. This seems a reasonable explanation of variable contrast emulsions produced in the manner indicated.

In the production of Varigam paper the basic emulsion is a high contrast enlarging paper, dye sensitised by one of the above-mentioned methods.



Wedge spectogram of Varigam paper by different light sources

Curves A in Fig. 5 show one method - the dotted lines illustrating changes in blue-green transmission. Curves B to F show another method. In practice, a compromise between these two is found most convenient. For this reason filters having the same gradation effect may differ in visual appearance.

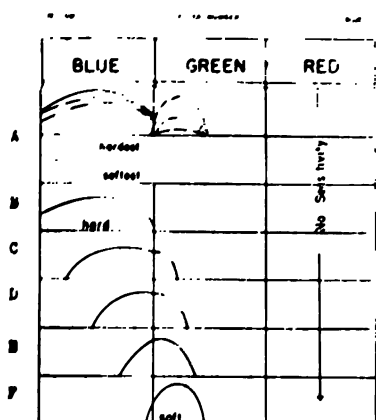


Fig. 5

It is natural to expect that different light sources will give different speed ratios with the blue and yellow filters. Table II gives interesting data in this connection. Since negatives requiring a soft gradation are usually heavy or dense the high efficiency of the green fluorescent is worthy of considerable attention; and it is possible in a post war world that special phosphors having somewhat more blue emission than the standard "green" may be produced.

Whatever light source is used, the gradation is constant with the extreme yellow and blue filters, but the standard set of ten filters will obviously be out of step according to whether a higher or lower colour temperature light source is used. Fig. 6 shows this in diagrammatic form.

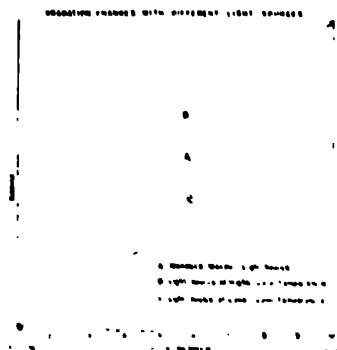


Fig. 6

Table II
EFFECT OF THE LIGHT SOURCE ON FILTER EXPOSURE TIMES WITH V

Type	Approximate Color Temp. °K	Yellow Exposure (V-G-1)	B. Exp (V)
Green Fluorescent Tubes ...	—	0.4	1
Mazda Lamps ...	2750	0.8	1
High Efficiency White Bulb Photo-enlarger Lamp such as G.E. #211, 212, 301 and 302	3000	1.0	1
Photoflood Photo - Enlarger Bulbs such as 6F #213 and 303	3400	1.4	1
White Fluorescent Tubes ...	3500	1.7	1
Daylight Fluorescent Tubes ...	6400	2.5	1
Mazda Mercury Lamps such as G.E. H-1, H-2, or H-4 ...	—	9.0	1

Varigam paper can be handled with a bright red safelight, such as Wratten O.

Now that Ilford in England and Defender in U.S.A. have produced a suitable paper, it is up to the manufacturers of enlarging equipment to produce enlargers wherein the colour of the light behind the negative will be changed by the movement of a lever without resort to light filters on the lens.

In conclusion, I would like to thank Mr. Seward Hagaman, of the Ex-

perimental Emulsion Department, Mr. Ralph Axon, of the Testing Department, and Mr. Centa, of the Product Application Department, for their assistance.

References

- (1) British Patent No. 494,068, U.S. No. 2,202,026.
- (2) A list of some dyes found to form be found in U.S. Patent No. 1 British Patent No. 547,060.
- (3) *The Photographic Journal*, August page 360.

BRITISH STANDARDS INSTITUTION ANNUAL GENERAL MEETING

The Annual General Meeting of the British Standards Institution was held on July 20th, following a luncheon at which Mr. Hugh Dalton, M.P., President of the Board of Trade, was the principal guest.

The Chairman, Sir Percy Ashley, K.B.E., C.B., said that 230 new and revised British Standards had been issued during the past year. The total number of British Standards now in use numbered 1,500, all of which could be consulted at the Library of the Institution, where copies of Overseas Standards are also available.

In the course of his address, the Chairman said: "I believe that those industries which have been long and closely associated with the development of the Institution recognise fully the advantage of having a single independent, national standards organisation. But those others

which are only now beginning to consider the opportuneness of it for a standardisation programme covering types and sizes, trade definitions, and performance standards, may feel that the preparation and promulgation of standard matter of domestic concern should, therefore, be carried out by their individual trade associations. There has also been some talk for Government Department standardisation work in the ways and on their own lines. I think that both these courses are wrong in principle, and that the best for any industry, and certain the industry of the nation as a whole, will be obtained only if all this is carried out within a national institution such as the British Standards Institution, which can co-ordinate and guide all such action to a successful end."

PHOTOGRAPHIC ASPECTS OF RADIOLOGY

A Symposium on the photographic aspects of radiology was held on November 12th, 1942, at 19, Prince's Gate, S.W.7. The meeting was arranged jointly by the Institute of Radiology, University of the Institute of Physics and the Scientific and Technical Group of the Society. Dr. H. P. Rooksbury, F.R.S., Vice-President of The Royal Photographic Society, was its Chair.

Mr. H. P. Rooksbury, B.Sc., F.Inst.P., read a paper entitled "Film and Image in X-ray Analysis." Mr. E. E. Smith, B.Sc., A.Inst.P., followed with a paper, "Dependence of Photographic Sensitivity on X-ray Quality." Mr. G. F. G. Knipe, B.Sc., then read a paper, "The Quantitative Estimation of Radiographic Exposures," and the meeting concluded with a paper by Mr. H. P. Rooksbury, F.Inst.P., "Some Fundamentals in the Processing of X-ray Films."

The first two papers are included in this issue, those by Mr. G. F. G. Knipe and Mr. H. P. Rooksbury will be published next month.

FILM SHRINKAGE IN X-RAY ANALYSIS

By H. P. Rooksbury, B.Sc., F.Inst.P.

(Research Laboratories of The General Electric Company, Limited, England)

THE particular property of photographic films with which this paper deals, that of shrinkage, is a real concern of the X-ray analyst. He is naturally interested in the interpretation of his X-ray photographs, and, as he calls them, diffraction patterns, almost inevitably he expects an extremely high standard of performance from the medium on which the patterns are recorded. Whilst admitting the good quality of modern X-ray emulsions he yet would have raised speed, because his exposures are very long, finer grain so as to obtain more sensitivity to the detection of weak reflections, higher contrast so as to obtain sharper definition of the pattern, and no shrinkage of film. Some of the demands may, of course, be quite incompatible with another. It is proposed to touch on the subject of film shrinkage purely from the point of view of the user of X-ray film, and to indicate the scope of the discussion.

A photographic film which does not change in size during processing, or at least change in length over a long period of time is no doubt indispensable in the X-ray methods for the determination of crystal film dimensions, but significant in the same method for measuring

in which the pattern is mainly used for crystal structure determinations and orientation measurements, and where accurate crystal lattice parameter determinations are not involved, the relatively small alterations in size of the photographic film are not noticeable. But in X-ray analysis by the preformed crystal method, accurate work cannot be undertaken unless due allowance is made for film shrinkage.

The subject can be divided into two parts. First, the effect of the shrinkage of the emulsion on the pattern, and secondly, the effect of the shrinkage of the film on the pattern. The shrinkage of the emulsion is a function of the processing conditions, and the shrinkage of the film is a function of the processing conditions and the material of the film.

X-ray Analysis by the Preformed Crystal Method

The preformed crystal method is a method of X-ray analysis in which the film is preformed into a specific shape, and the pattern is recorded on the film. The method is used for the determination of crystal dimensions, and the shrinkage of the film is a function of the processing conditions and the material of the film.

(a) The Shrinkage of the Emulsion

A usual type of emulsion is one in which a silver salt is held in the photographic film by means of organic groups of the emulsion. The silver salt is held in the film by means of organic groups of the emulsion, and the shrinkage of the emulsion is a function of the processing conditions and the material of the film.

The shrinkage of the emulsion is a function of the processing conditions and the material of the film. The shrinkage of the film is a function of the processing conditions and the material of the film. The shrinkage of the film is a function of the processing conditions and the material of the film.

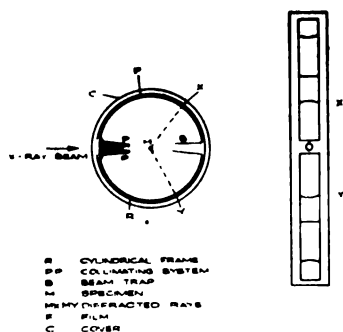


Fig. 1

substance having one of the simpler crystal structures the lines can be indexed and values for the crystal lattice parameters, or the size of the basic unit cell of the space lattice can be worked out. In any event, since a good way of characterising an X-ray pattern is by listing the planar spacings, their accurate evaluation is of considerable importance in X-ray analysis.

It is obvious that the accuracy of the calculations depends upon the precision with which the θ values can be determined, and we have to consider the methods employed in practice for obtaining these values with a sufficient degree of accuracy.

If the radius of the camera is measured, the various θ values can be calculated from the linear distances between corresponding lines on the pattern. But, accepting the fact of film shrinkage, the radius of the film is not exactly that measured on the camera. The shrinkage also may be different from one film to another, and may vary with the time after processing at which measurements are made. Moreover, the magnitude of the error will be different for low and high θ values.

It is probably worth adding here that it is necessary to wait several hours after the film is dry before making any measurements at all. This ensures that the film will have assumed its equilibrium condition and will not alter in dimensions during the course of the measurements.

(b) The Bradley-Jay Type of Circular Camera

The most usual way of setting the film in the camera is that which was indicated in Fig. 1 and is shown again in the centre diagram of Fig. 2, taken from a paper by Lipson (2). The X-ray beam enters between the ends of the film and emerges through a hole punched in the centre. The film shrinkage difficulty is obviated by causing fiducial marks to be

registered at each end of the film. This is done by incorporating in the camera at the high angle position, near the point of entrance of the X-rays, two metal knife edges, as first suggested by Bradley and Jay (3). These cut off the rays scattered and reflected from the specimen so that sharply defined shadows terminate the exposed film. These knife edges are usually arranged so that the fiducial marks fall at a θ value of about 85° . The precise value, θ_k , is found either by direct measurements on the camera, or by calibration with a substance such as a quartz, whose lattice constants are accurately known, and the θ values of whose reflections can therefore be precisely calculated.

We thus have registered on the photograph of any substance positions of known θ value. An angular value, θ_k , is the camera constant. If S_k is the linear distance apart of the fiducial edges, the θ value corresponding to any pair of reflections

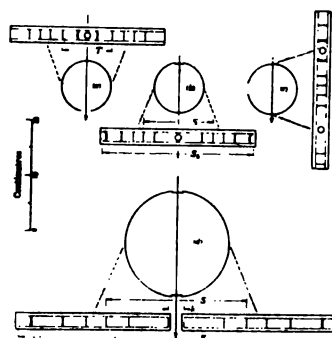


Fig. 2. Diagram (due to Lipson) showing the usual film arrangements in cylindrical powder cameras and the types of film resulting from each

whose distance apart is S can be obtained from the simple equation $\theta/\theta_k = S/S_k$. A tacit assumption is that the film shrinks in a uniform manner, but the assumption appears to be well justified in practice.

The θ values determined by this fiducial shadow technique are subject to certain systematic errors due to such factors as divergence of the X-ray beam, eccentric mounting of the specimen, absorption in the specimen, and so on. Comparatively simple graphical methods have been devised to compensate for these errors, and these enable the crystal lattice spacings to be determined with a high degree of accuracy.

(c) Alternative Methods of Setting the Film in the Camera

There are two other ways of setting the film in the camera. The film may

be reversed, so that the X-ray enters the camera through a hole punched in the centre and between the ends. This brings sensitive high angle or reflection lines near the centre of the film, as shown in the top diagram of Fig. 2. If S is the distance between corresponding θ in radians is given by

$$\frac{\pi}{2} - \frac{S}{4r}$$

Since the S values of the lines useful for lattice parameter calculations are small, variations in the length of the photographic film do not introduce very large errors. There is, moreover, no need to know the radius of the film with a very high degree of accuracy, and its value will vary with the amount of film shrinkage.

In the third method, the film is placed in the camera, asymmetrically as indicated in the diagram on the right of Fig. 2. Two holes are punched in the film for the entry and exit of the X-ray beam, the ends of the film are set at angles corresponding to a Bragg angle equal to 45° . For calculations poses no knowledge of the radius is required; on any given film the 0° position is obtained by the distance between corresponding low angle reflections and the position by measuring the distance between corresponding high angle reflections. The θ values corresponding to any other pair can be found by interpolation; again, alterations in film length to shrinkage or expansion are relatively unimportant.

(d) Large-Diameter Cameras

So far we have been considering methods applicable when the camera diameter does not exceed 19 cm. With cameras of larger diameter none of the three methods of the film described are practical because the length required is too great to be handled conveniently. A camera of 19 cm. in diameter nowadays frequently employs in this the single film is replaced by two symmetrically disposed films. Four knife edges are required to limit the ends of each film to fiducial shadows. The arrangement is illustrated diagrammatically in the lower part of Fig. 2. There will be a low angle camera constant as well as the high angle constant and the calibration can be carried out as far as θ_k is concerned in the same way as for the smaller diameter camera. It is found practical, however, to use a fixed distance k instead of a low

in the computation of the reflections on any graph is thereby simplified. A distance k is added of distances along the film from the low angle fiducial mark S and S_k . There is introduced, of course, in the computation, because of film shrinkage, but it is to produce a negligible error in interplanar spacing and in other determinations.

As a set of X-ray powder photographs of miscellaneous substances on the 19 cm. diameter camera, only one half of the pattern, from one of the films used, is reproduced; the other half is mirror

image in length of the film are likely to occur that may well be objectionable and lead to appreciable errors in interplanar spacing measurements. If the film contraction takes place continuously the fiducial edges that have been discussed will show marked diffusion and, consequently, will be difficult to locate exactly. What is more usual is that two or more shadows of different densities appear, because the slip of the film has occurred in jerks as the tension on the holding mechanism reaches certain critical values. The appearance of knife-edge shadows when this occurs is shown in Fig. 4. If the high angle fiducial shadows have this character and measurements are made to the edge of the outermost shadow high

remains sharp. Since lattice parameters are determined mainly from high angle reflections they are not seriously in error even when the film slip is substantial, but the deterioration in definition of the low angle reflections remains, and for general analytical purposes this is definitely unacceptable.

This form of film contraction is not directly attributable to changes in temperature. Hume-Rothery and Raynor (4) point out that it is probably due to a change in moisture content of the photographic emulsion, resulting from the transfer from the relatively cool conditions in a box in the darkroom to the warm conditions in the camera on the X-ray apparatus. The films tend to lose moisture

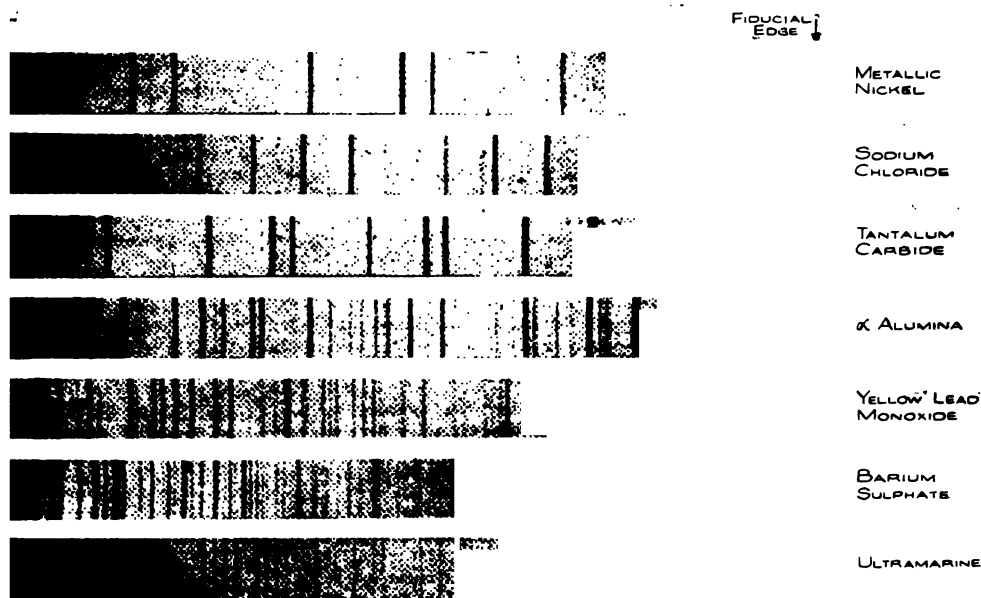


Fig. 4. X-ray powder photographs (19 cm. camera, Cu K α radiation). Miscellaneous inorganic substances

be another. The sharp edges limiting the ends of the patterns should be observed.

Contraction During the

aspect of film shrinkage become a source of difficulty in X-ray analysis, if not with it, it is concerned with the changes in length that occur in the photograph.

The time required for a photograph varies with the substance measured in hours, minutes, and exposures are not abnormal. The time required for a photograph varies with the substance measured in hours, minutes, and exposures are not abnormal. The time required for a photograph varies with the substance measured in hours, minutes, and exposures are not abnormal.

values for the interplanar spacings will result, because the mean positions of the diffraction lines will appear to be at too low angles. A further objectionable feature is that, when the effects described are appreciable, the lines themselves become broadened, with an inevitable increase in uncertainty in measurements and in the detection of weak reflections.

It happens that in the large 19 cm. diameter camera the films are held rigidly at the high Bragg angle ends, but they are relatively free to move at the low angle ends. Consequently, the contraction of the films affects only the low angle fiducial marks, and the definition of the other fiducial marks

directly after insertion in the camera, and the loss is accompanied by a contraction in length; this may be retarded when there is constraint upon the film, but slip undoubtedly will occur at some stage during the exposure.

The difficulties could, no doubt, be alleviated by carefully controlling the conditions of storage of the film, and possibly the humidity conditions in the camera by passing through it gas of carefully adjusted water vapour content. This rather elaborate procedure has not been found to be necessary if certain simple precautions are taken. Briefly, these comprise conditioning films that are about to be used by removing them

uniformly in one batch of films or not? ring to the question of paper, he had sally considered the use of paper in this but the paper which was used for stats" contracted, expanded, twisted ned in the most unaccountable manner, did not think much of the suggestion to er. It had been suggested that a more t material would be paper impregnated lastica, and he asked if it might be : to get something very constant in this

CHAIRMAN remarked that it was un- hat paper impregnated with plastics e practicable.

OOKSBY, in reply, said that Mr. Kayser vays very provocative. He had sug- that the paper raised a storm in a but it was really a very big storm. The were very real. As far as the question irst type of shrinkage was concerned— m processing—one could have punch

he did not mind what kind of fiducial ere put on, and had suggested a method was in use. They were discussing a measurements, and that should be a mind. Obviously they did not want a number of photographs which were sfactory; everyone wanted to turn out ork. Mr. Kayser had suggested that hree cameras could be used; this could , but a special place would be needed to em in, and they were expensive.

r as the other aspect of shrinkage was ed—that taking place inside the camera the exposure was being made—he his hearers that if the film was not med beforehand a bad film was the very time. "Fuzziness" of lines was dsirable. They were aiming at the sible result; a second-rate result might ceable for some purposes, but he would btain a first-class result every time. not discussed what order of changes in

length were obtained if the film was not conditioned, but thought changes of 2 mm. between one shot and the next were possible if the operator was not careful. This was appreciable, and it was better to take precautions.

Mr. RENWICK asked, assuming that the question of instability of dimensions was overcome, whether there was any strong preference for a transparency as against an image for viewing by reflected light in X-ray analysis work?

Mr. ROOKSBY replied that this was a difficult question. On the whole he thought transparencies were preferable. He had tried papers from time to time, particularly one known as "Kryptoscreen," but the degree of contrast on that paper, although very good and excellent for radiographic work, did not come out so well in X-ray crystal analysis. He had an idea at the back of his mind why this was so, but the present was not the time to discuss it. The best contrast which one would ever obtain on paper, and the corresponding clarity of photograph, was necessarily not so good as that on the transparency, and therefore the transparency was preferable.

Mr. FRY said that it seemed that many precautions were taken before and during exposure, but was anything special done in the way of processing, and did that have any marked effects on results?

Mr. ROOKSBY replied that no special precautions were taken to adopt very stringent rules with regard to processing. The manufacturers' recommendations were followed as closely as possible so far as X-ray film was concerned. The point about the method was that if the film was reasonably well processed and if every part was treated in the same way, it could be assumed that any change in length was uniform along the film and that the change could be compensated for. It was that change of length with which he was concerned.

Probably a member actually concerned with the manufacture of X-ray film could answer the question.

Mr. E. R. DAVIES asked whether he could add something to this question of dimensional change. Excellent though Mr. Rooksby's paper was, the speaker was not sure that it brought out very clearly the fundamental reasons why changes were experienced in material such as film base. Film base was made from cellulose nitrate or acetate, which were to some extent hygroscopic; in absorbing water vapour it expanded, and when the vapour was expelled, it contracted. This change was almost exactly reversible, but along with it irreversible changes might occur, because the base contained plasticising substances which might be expelled permanently and lead to a permanent change. The answer to the processing question lay there; one could not dogmatize; processing might lead to permanent losses, but, with care, these can be minimized; the essential point was to bring the film back to equilibrium with air of the same relative humidity as that with which it was in equilibrium before and during exposure. If the film was treated severely, say, by boiling in water, there might be a total contraction of the order of one per cent, but he doubted whether it would be more than that.

The answer to the temperature question was that the factor of real importance was the absorption of water vapour; temperature *per se* had very little effect.

Mr. Davies confessed to a little sympathy with Mr. Kayser's comments. In looking at the literature he had wondered at times whether physicists had tended to regard film base as something as impervious to atmospheric changes as a metal, and had ultimately woken up to the realization that it did suffer, like other colloidal material, changes in humidity temperature.

THE DEPENDENCE OF PHOTOGRAPHIC SENSITIVITY ON X-RAY QUALITY

By E. E. Smith, B.Sc., A.Inst.P.

(Physics Department, National Physical Laboratory)

order to specify an X-ray beam npletely, both quality and antity have to be known. ing the methods introduced for medical purposes to de- act fine these factors, pro- duces a non-uniform se of photographic materials rious X-ray qualities. Similar are obtained for exposures electrons of differing energies. ms are used to measure X-ray hen unless the quality is known nstant the results may be in

error by a large factor depending on the exciting voltage on the X-ray tube.

THE blackening of photographic plates by X rays was one of the earliest properties to be observed, reference to it being made in Röntgen's original paper. Only recently, however, has it been possible to measure X-ray beams with precision and, in consequence, many of the available data concerning the photographic effect are merely relative and

not absolute. In order to appreciate the quantitative nature of more recent work, a knowledge of the nature of the X-ray beam, and the methods adopted for defining it, is necessary.

X rays are of the same family of electro-magnetic waves as visible light, the only fundamental difference being that of wavelength. Whereas visible radiation has wavelengths ranging from about 4,000 to 8,000 Angstrom units, the wavelengths of the X rays most commonly

used in practice lie in the region of 0.01 to 10 Angstroms.

The most important property of X rays is their ability to penetrate matter which is normally opaque to visible light. This effect becomes more pronounced as the wavelength gets shorter and radiation is referred to as being hard or soft according to penetrating power. Hard radiation is more penetrating than soft radiation, these expressions owing their origin to the gas tubes first used for producing X rays, with which it was found that the hardness of the vacuum determined the penetrating power of the resulting radiation.

X rays are produced when electrons are retarded by impact with matter, and in a modern X-ray tube the electrons are emitted by an incandescent tungsten filament, are accelerated by a high potential and

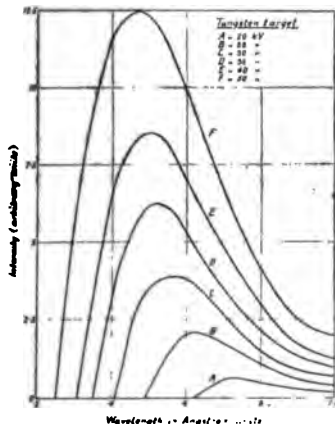


Fig. 1. Spectrum of tungsten radiation. Various voltages

strike the target of the tube with considerable velocity. A small proportion of the energy (one per cent or less) is converted into X rays. These rays are emitted in all directions and may be analysed by means of a crystal in a manner similar to the analysis of visible light by means of a diffraction grating. It is found that the rays consist of a continuous band of radiation of varying wavelengths upon which may be superimposed groups of lines characteristic of the target material. The greater the potential across the tube, the greater the X-ray output for a constant tube current, and the shorter and, consequently, more penetrating the mean radiation. Typical curves are shown in Fig. 1, in which energy distributions for a tungsten target are given for varying excitation voltages. The area under each curve represents the total amount of energy emitted, and

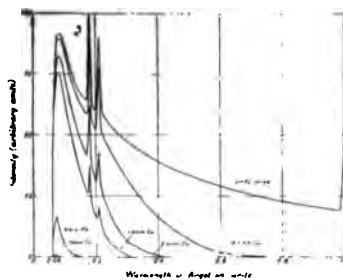


Fig. 2. Spectrum of 200 kV. tungsten radiation. Various filters

it will be observed that as the voltage is raised not only does the total quantity of energy increase, but the region of maximum energy is progressively shifted towards the shorter wavelengths. The voltages used were insufficient to excite the characteristic K radiation of tungsten which is emitted at about 70 kV.

When we pass the X-ray beam through a filter such as aluminium, copper or lead, the rays of different wavelengths are differentially absorbed and the relative constitution of the emergent beam is consequently changed. There is a greater proportion of the short-waved or harder radiation than in the incident beam, so that the X rays, although reduced in intensity, are rendered harder by filtration. This is illustrated in Fig. 2, the radiation being that of tungsten excited at 200 kV. The upper curve represents the energy distribution in the unfiltered beam. There is an abrupt rise to a peak at the short wave end, followed by a more gradual fall until the characteristic K radiation is reached. After passing this region the diminution of intensity is continuous until at a wavelength of 1.0 Angstrom unit another peak, due to the L radiation is reached. The lower curves represent the intensity distribution after varying degrees of filtration. It will be seen that the total energy is diminished by filtration, but at the same time the average wavelength is reduced and the beam becomes progressively harder. Thus it is possible to increase the hardness of an X-ray beam either by increasing the voltage on the tube or by filtration.

To determine the quality of an X-ray beam absolutely, it is necessary to know the distribution of the intensity over the wave band in the beam. This is a formidable task, and in practice use is made of penetrating power in order to assess the hardness or quality of the radiation. The method adopted is to determine the thickness of filter, which may be of aluminium, copper, tin or lead,

depending on the hardness of the radiation used, which will reduce the incident radiation to half its original amount. This thickness is called the half-value layer (h.v.l.), and is found to be a sufficiently accurate means of specifying quality for medical purposes. This does not mean that it is equally satisfactory for any other uses to which X rays may be put, such as radiography, but so far, there is no evidence that serious errors are likely to arise from this practice.

It will be obvious from the above definition of X-ray quality that beams with the same half-value layer but widely differing spectral distributions and intensities may be obtained by various combinations of voltage and filter. As an example, 180 kV. tungsten radiation filtered by 1.0 mm. aluminium has the same half-value layer (0.26 mm. copper) as 80 kV. tungsten radiation filtered by 0.3 mm. copper + 1.0 mm. aluminium, the intensity in the first case being about twenty-five times that in the second. These two radiations would be considered equivalent in quality for medical therapeutics, and measurements have shown that to a first approximation they produce similar photographic effects.

The other question to consider in defining an X-ray beam is how to measure the quantity of radiation. Various absolute measurements have been made from time to time by means of the heat produced by a beam when totally absorbed, but the quantities involved are so small that accurate determinations are difficult to make. When reliable measurements were required for X-ray therapy, a simpler method was adopted which had a bearing on the principal use for which the measurements were required. X-ray therapy depends for its effects on the quantity of radiation absorbed by tissue and not on the incident amount. A soft beam will be more readily absorbed than a harder beam and its therapeutic effect greater in consequence. Thus, if the unit adopted was to have any simple application to medicine it must have similar tendencies. The amount of ionisation produced in air is proportional to the quantity of radiation absorbed, and it was decided that a unit based on this effect would be the most satisfactory that could be achieved. This unit is called the Röntgen, and is defined as the quantity of X or γ radiation such that the associated corpuscular emission per 0.001293 gramme of air produces, in air, ions carrying one electrostatic unit of quantity of electricity of either sign. This merely means that the quantity of

city produced per cc. of air at is one E.S.U. per Röntgen. The energy required to ionise air is found to be constant over a range of wavelengths, the energy may be considered as lent to a certain quantity of absorbed and is actually equal to 0.11 erg.

The degree of blackening produced on a photographic plate will also depend on the energy absorbed, and for this reason it seems to have been assumed that the photographic blackening per Röntgen is independent of quality. Unfortunately the absorbing medium in photographic materials consists of elements as silver and bromine, as they are not similar in atomic number to the elements making up air, have differential absorption effects. Consequently it is that the sensitivity of photographic materials depends to a considerable extent on the quality of the beam. Curves relating film sensitivity and X-ray quality are shown in Fig. 3, in which the number of Röntgens necessary to produce a blackening of 0.5 is plotted against the half-value layer in mm.

Three curves are shown, the first relating to the unscreened film, the second to the film when screened by two different thicknesses of lead. For the unscreened film it is found that there is a maximum sensitivity for qualities of the order 0.2 mm. Cu. h.v.l., while if the film is screened, this maximum is shifted to the harder radiation. Variations are indicated that depend on certain conditions of ionisation and filtration. It will be seen that for the unscreened film there is a tenfold sensitivity variation in the range of qualities shown in the figure, whereas if the film is screened this variation is reduced, but the full range is progressively diminishing to the almost total elimination of the softer rays by the filter. The shape of the characteristic relating blackening and log. exposure is virtually independent of quality, and so far as is known there is no reciprocity effect for the direct action, the shape of the curves in Fig. 3 is independent of both the quality chosen as standard and the range of exposure. Similar curves obtained with different types of photographic materials and the results of various workers are shown in Fig. 4. All the curves show the same tendencies, but there are considerable variations between them, which may be due more to differences in dosimetry than to differences between the photographic films.

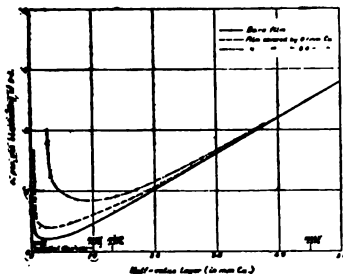


Fig. 3. Exposure (in Röntgens) of various qualities necessary to produce a blackening of 0.5

It should be realised that these results relate only to the direct X-ray action. If intensifying screens are used, different effects may be anticipated, as in that case practically the whole blackening is due to the fluorescent radiation emitted by the screen, so that it is the response of the screens to the various X-ray qualities that becomes the more important. Moreover, if screens are used there is a marked reciprocity effect, the fluorescent radiation being in the visible region.

An important aspect of the problem is its application to the protection of X-ray workers from the harmful effects of the radiation. It is accepted in the International and British Protection Recommendations that the amount of radiation that can be withstood with impunity is one Röntgen per week. Any exposure in excess of this so-called tolerance dose might produce harmful effects, and workers should, in consequence, keep a check on the quantity of radiation they receive. The most satisfactory way to do this is to carry on the person a small charged ionisation chamber by which the exposure can be measured, but this technique is difficult to perform and can only be carried out in well equipped laboratories. An alternative method is to employ photographic films. Small dental films are suitable for this purpose, and providing the quality of the radiation to which the worker is exposed can be ascertained, then

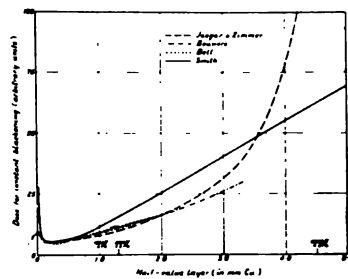


Fig. 4. Dependence of blackening on quality. Various workers

standard films can be prepared for comparison with the test films. This is a practical proposition in medical diagnostic work where the range of qualities (as shown in Fig. 3) is small and lies in the region of almost constant response of the emulsion, and a national scheme is now in operation whereby these doses can be determined. Therapy workers and industrial radiographers, however, are subjected to radiation from a much wider range of voltage and filtration and, in consequence, the use of photographic films to estimate exposure is subject to more error. In fact, as may be seen in Fig. 3, there is a tenfold difference of sensitivity between 200 kV. radiation filtered by 4 mm. lead (the recommended thickness) and radiation with a half-value layer of 0.2 mm. Cu., both qualities being possible in practice with a 200 kV. industrial plant. If the operating voltage is higher than 200 kV., then the difference will be even more marked. It is possible to obtain some idea of the mean operating quality by covering part of the film with a copper wedge so that the absorption may be estimated, but owing to the varying film sensitivity the dose may only be determined between wide limits, and in cases of doubt recourse must be made to ionisation measurements.

The dependence of sensitivity on quality is also important in experimental work in which the intensities of X-ray spectra are determined photographically, and corrections must be applied for this effect. Another case where it may be of importance is in the radiography of materials containing flaws of varying thicknesses. If an attempt is made to assess the size of the flaw by means of the effect on the film it should be realised that the quality of the radiation reaching the film is different for the varying degrees of filtration in the specimen and allowances may be desirable to correct for this. Similarly, oblique rays not only in general have to penetrate more material, but are rendered harder in the process, both factors reducing the photographic effect.

It is interesting to note that exposures due to the direct action of electrons as in the electron microscope or in the determination photographically of β -ray spectra, are dependent on the energy of the particles. Recent work has shown that once again there is a maximum sensitivity with a diminution on either side. From this it has been possible to produce enhanced effects with high energy particles by reducing their energy to the optimum by appropriate filtration. These effects

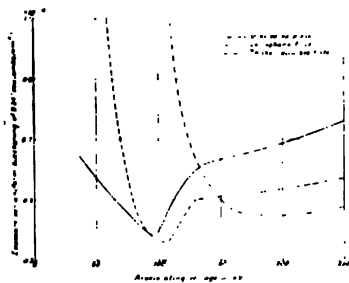


Fig. 5. Dependence of blackening on accelerating voltage

are illustrated in Fig. 5. The optimum voltage is of the order of 100 kV, and various workers have obtained similar results. Thus there appears to be a marked similarity between the exposure of photographic emulsions by means of X rays and fast electrons. Low energy electrons on the other hand behave similarly to visible radiation, and it should be possible by this means to throw much light on the mechanism of the exposure of photographic materials.

Summarising, it has been explained that in order to specify an X-ray beam completely, both quality and quantity must be known. Adopting the methods introduced for medical purposes to define these factors produces a non-uniform response of photographic materials for various X-ray qualities. Similar effects are found for exposures due to electrons of differing energies.

If films are used to measure X-ray dose, then unless the quality is known and constant, the results may be in error by a large factor depending on the exciting voltage on the X-ray tube.

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Discussion

Dr. R. H. HARRIS said that one of Mr. Smith's slides had shown the sensitivity of the photographic film to electrons. He asked whether in these investigations the supercoating of the film had been considered, because he thought that the lower voltage electrons would be stopped completely by the supercoating, and this might have a great effect on the sensitivity of the photographic emulsion in the experiments. Had Mr. Smith any explanation for the decrease in sensitivity of the films to low kilovoltage X rays?

Mr. SMITH replied that he was not very familiar with the electron aspect, and could not say whether the supercoating had been taken into account or not in preparing the curve for the unscreened film. The work which he had quoted had been published quite recently in the *Journal of Applied Physics*, and all he could say was that the cellophane filter, the effect of which had been shown, was many times thicker than the supercoating. He had, how-

ever, studied the literature carefully and the effect he had demonstrated had been noted over a number of years, and there was much evidence to enlarge on the results which he had shown on that particular slide. There was no doubt that the effect of the accelerating voltage was considerable and there was a maximum sensitivity around 100 kV. Ellis and Aston, in their work on the gamma-ray spectrum, used the photographic method of determining the energies of the photoelectric beta rays, and took into account the varying sensitivity of the films for beta rays of different velocities.

With regard to the X-ray aspect, the decrease in sensitivity with soft radiation was not to any extent due to the absorption of the X rays in the wrappings or supercoating of the film. There was some effect, but it was not large in the region shown in the slides.

Mr. H. S. TASKER could not help feeling that Mr. Smith's paper had rather regarded the properties of an X-ray emulsion in the same way that chemists might regard an absolutely determined compound. There was no reference to the different emulsions which were now on the market—emulsions which differed considerably in the shape of the characteristic curve, and it occurred to the speaker that it was possible that some of the differences, at least between the different workers which had been recorded, might quite well be due either to advances in one type of emulsion in the course of years, or because different types of emulsions had been used. It was most important that the exact type of emulsion and the conditions of processing should be carefully studied and reported in any work of this nature.

The CHAIRMAN remarked that although emulsions differed in speed there was no evidence that they differed markedly in spectral sensitivity to X rays. He wondered whether the latter was a function of the silver halide mixture used, and other emulsion-making conditions might have very little effect upon spectral sensitivity.

Mr. SMITH replied that he had tried various types of emulsions from time to time and they all showed fundamentally the same characteristics. There were differences in detail and limited variations had been observed. The types he had tried certainly did not diverge to the same extent as that indicated by the work carried out by Jaeger and Zimmer. He could appreciate that if the emulsions were loaded with elements which differed from the normal ones of silver, bromine, iodine, etc., results might be obtained which would show differences in detail.

A similar sort of investigation was carried out at the National Physical Laboratory to relate the change of colour of barium platino-cyanide to the incident X-ray dose measured in Röntgens. When ionization X-ray dose measurements were introduced, the equivalence of the two systems of dosage had to be determined and a quality dependence curve, very similar in shape to the photographic one, was obtained. Commencing at the soft radiation end, there was a progressive increase in sensitivity until a maximum was reached, after which the sensitivity fell again, just as in the

case of photographic films. The effect calculated from a knowledge of the cross-section of barium platino-cyanide. Similarly in the case of films, if they were to calculate the amount of X-ray energy absorbed at various qualities, it is possible that the shape of the film curve could be calculated with a degree of precision.

Dr. SPIEGELER said that there might be other reasons for the effects obtained. The meters were supposed to be independent of X-ray quality, but this was not always the case. In the curves demonstrated by Mr. Smith by Jaeger and Zimmer, it was not unlikely that it was at least possible that the dose in R-units for the different qualities of radiation was not quite the same. In other words, it was certain that all the dosage measurements in agreement with each other, particularly considering the very great range of quality.

Mr. SMITH thought this was quite likely. One of the explanations for the differences between the various curves. X-ray measurement was a new science and there were only a few standard free air ionization chambers in the world. Other workers had to use standard chambers which were generally of fundamentally different character and great majority of cases were not equivalent to the standard chambers which had been established.

The primary standard chamber in this country was at the National Physical Laboratory, so that dosage work carried out could be relied upon, but Jaeger and Zimmer might have been working with a sub-standard chamber and, in consequence, the difference in their curves might be due more to dosage measurements than to any difference between the photographic films used. Another point to mention in this connection was that the differences due to faulty measurements were more likely to occur at the soft radiation end, and it was quite possible that had he matched the curves with other at the hard radiation end, the difference would have occurred at the soft end and would have been more reasonable.

A MEMBER asked if Mr. Smith could say whether the thickness of the emulsion had much effect on the shape of the curve. He wondered whether the falling off of sensitivity of the image was due to the absorption of radiation which was absorbed.

(This speaker was imperfectly heard.)

Mr. SMITH replied that in general the intensity of the incident radiation which was absorbed by the photographic film was small as compared with the variation in thickness of the emulsion. He thought that one could assume that the variation in thickness of the emulsion did not affect the shape of the curves at the soft radiation end, but that one could assume that the variation in thickness of the emulsion did affect the shape of the curves at the hard radiation end, and the variation was due to the differential absorption in the film compared with that in the material in which the radiation was absorbed. In a therapeutic work it was decided that the easiest method of measuring X-ray dose was by air ionization, which is, of course, subject to sensitivity variations for phenomena of absorption in materials other than air.

COLOUR PHOTOGRAPHY : CAN IT BE ART ?

Normal meeting of the Colour Group of The Royal Photographic Society was held at 16, Prince's Gate, S.W.7, on January 3, with Mr. F. J. Tritton, B.Sc., F.Inst.P., F.R.P.S., in the evening when a discussion on "Colour Photography: Can it be art?" was opened by Mr. V. P. Milner, A.R.C.A., an artist by profession and a teacher of art.

MILNER, in opening the discussion, recalled his impressions on attending a meeting of the Colour Group. He had been accustomed to art, but he realised at once that it was a scientific rather than an artistic atmosphere, though why photography was not included as "pictorial" in the sense in which the word was understood by photographers, he could not say. There was a Pictorial Society, but he understood that group was solely concerned with work in monochrome. He realised that among colour photographers a great part was played by the relative merits of their productions.

Colour lantern slides seemed to be very fine, not only from a technical point of view. To have

to say was the main aim of the artist, and many works in colour photography were said to be well.

They had a significant which he thought was nearing the essence of production, but one or two emotional quality which was in the rank of works of the work of Colonel Symon, he, he felt that there was an artistic vision.

History of colour photography hitherto a struggle over points, and only when these were realised that it was technical achievement noted in the last analysis, quality of imagination, of colour print might be barren though it was meticulously technique. The scientist as happy so long as he got reproduction of his subject, artistic worker realised that something deeper which was, and that, in spite of in technique, there recurred inferiority so long as deeper thing was not forth-

black and white pictorial looked at the colour photo-

grapher as a man who was playing with a scientific novelty. He seemed to feel that the colour photographer was purely concerned with technical matters, while he himself was concerned with pictorial representation, with the balance of light and shade, and so forth. Colour photography had really no historical background, it had a scientific background, not a cultural one, and for that reason art critics could not be expected to appreciate it and the artist rejected it because it was born in the laboratory. It was, as he said, a scientific novelty, and that had caused many to scorn colour photography.

The commercial side also came into the reckoning. The question had always to be asked: "Will this process be a commercial success? Will it be popular?" And there was this further consideration, that a really fine thing could not be popularised. If an attempt were made to popularise it the result would be to vulgarise it. As this was a Royal Society, it was specially incumbent upon it to press these things forward in a dignified way and not in a commercial way. Not that commercial photography was at all cheap. He was familiar with commercial art, and he realised that some of its technical qualities were as fine as, or finer, than anything in many Academy pictures. But up to the moment in colour photography there was more concern with reproduction than with re-presentation. They had been thinking to a great extent in terms of step wedges and of colour filters, and had not left any opening at all for self-expression.

Mr. Milner then proceeded to show several examples of colour painting of his own, which he thought, with all their faults, were more along the lines of personal art expression through pigmentation (for comparison with processes under discussion), than from a pictorial point of view. Emotions could be expressed pictorially through colour, and he thought that once their technical difficulties had been mastered, colour photographers should devote them-

selves to getting these emotional qualities of Nature into their productions. Otherwise they were really doing nothing more than reproducing a colour chart, which they could reproduce almost perfectly with the aid of filters and the step wedge.

As for pure design, that seemed to be a matter with which many colour photographers were poorly acquainted. Some of them lacked a sense of harmony. The painter used as a medium of his expression the quality of his pigments and the texture of his canvas. The colour photographer had the various methods of Wash-off Relief, dyeing, the Carbro process, and so on. Were these latter significant from an art point of view? There were many people who complained of thinness and lack of depth in colour photographs. In conclusion, he described some of his experiments with expressive pigmentation in colour photography and passed round examples of his work. He also showed some colour photographs, which he said had been processed in less than two hours; one of them took exactly fifty minutes to produce from the bromide.

Mr. SCOTT BUSHE said that he had felt very pleased that Mr. Milner should take so much interest in their work as colour photographers, and many of his remarks had been enlightening. To colour workers the step wedge became a symbol, not merely three pieces of grey paper, but an effort at self-expression. Of course, full self-expression was never reached. Compromises had to be accepted, but if they could only get the step wedge right, then they knew they were getting what they set out to get.

The popular and commercial side of colour photography was more a question of the interest of the manufacturers than of the members of the Colour Group. He thought a certain amount of sympathy must go out to people who realised that pictorial photography could still be an art, but that it was not necessarily a one-man art. It might be necessary to have a whole group of men working together to produce something. Would it, indeed, be possible for a man to live long enough to do all the work himself and not get sunk in step wedge technique?

Mr. JEFFRES said that the step wedge was an awful nuisance, and he did not think it should be taken too seriously. At the same time, it helped to get them on the right lines, and, as a painter-artist, Mr. Milner would agree that he would be very much troubled if he opened a tube of

blue paint and found it not quite the right colour. That was what the step wedge existed to correct so far as colour photography was concerned.

Mr. MILNER said that if they were colour photographers they should be able to mentally translate a negative into colour, and, by colour-correction, obtain the result they wanted at every stage. They were very busy in their technique if, for example, a red turned out blue.

Mr. JENKIN said that he thought colour photography might one day be considered art, but there were so many commercial difficulties in the way that that would not happen for a long time yet. The colour photographer was, first of all, attracted merely by colour. Most of those who practised colour photography had just slid into it, they had not set out to be artists. They were involved more in science than in art at the present moment. They were endeavouring to get full control of their medium. When they had got over that particular stage, the artist would come along.

Mr. JACK COOTE said that so far in the discussion it had not been decided what colour photography was. He thought it could be assumed, for the purposes of argument, that colour photography would be some process whereby they could exactly reproduce the form and colour of what was before the camera. So far as he was concerned, that and nothing else was colour photography.

The CHAIRMAN said that that was the whole cleavage of the discussion, as to whether they were to look upon colour photography at this stage as a technical method of reproducing whatever might be in existence in front of the camera, or whether that was the wrong way of looking at the process which incorporated some greater artistic significance.

Mr. SCOTT BUSHE asked who was going to decide what was put in front of the camera, and what values were to be given by choice of arrangement, lighting in fact, all the technique. What of the colour-temperature of the lights, for instance?

Mr. COOTE replied that the decision would be that of the artist.

Mr. SCOTT BUSHE then reminded the meeting that the artist as such did not always see what was in front of the camera.

Mr. HENNING said that he very much agreed with Mr. Scott Bushe. He took an analogy from films. There was no doubt, even in the highest circles, that a film could be a work of art, but in the production of a film there was not one artist, but probably many. That brought up

the question: "What is art? Who is an artist? And, further, 'Is an artist always an artist? And in everything he does?'" It would be a mistake, for instance, to look at a painting and judge its merits with the eyes of a photographer, and yet photographic work was continually being judged by the conventions of painting. And, as regards the question whether an artist is always an artist: If an artist of world fame made a very good water-colour, without doubt a work of art, and sent it to one of the galleries, and it was exhibited there, it might be sold for, let us say, four hundred guineas. Thereupon the manager of the gallery might inform the artist and suggest that he should repeat his performance, and the artist might sit down and create more or less the same water-colour, though, perhaps, in a different size and from a different angle, and this second water-colour would again be sold for four hundred guineas. But nobody was going to convince Mr. Henning that the second water-colour was a work of art. The artist was not then using his artistic inspiration, he was just using his skill to repeat a commercial success.

It had been said that art was Nature seen through a temperament. Or, again, art was "Nature plus creative man." If some means of reproduction was placed in the hands of a skilled craftsman he would reproduce Nature as it appeared, but that would be no more than a technical reproduction, it would not be Nature seen through a temperament, or "Nature plus creative man." To put it in other words, it would not bring in emotion. Colour photography, of course, was a different and, perhaps, more difficult medium than black and white photography, but if they were agreed to have in both a medium of expression, the next question would, no doubt, be whether the medium expressed itself as in the work of a skilled craftsman, or whether the worker was able to express himself through the medium as the artist does. To produce many of the modern works of art, collaboration is necessary. It was certainly necessary in the film, and it was probably necessary also in colour photography, yet it should be remembered that in the greatest times of classic art the masters had collaborators. There were many old Italian paintings of which one could not be absolutely sure that the masters to whom they were ascribed did them alone. Mr. Henning concluded his remarks by repeating that an artist need not be considered an artist in all that he produced, and that some works of art needed

the collaboration of several.

Mr. MILNER said that the day of his art school once asked whether he could give a definition of art, and after he had made vague attempts to do so, the principal defined it as: "Art is Nature through the alembic of man wished to make it plain." It was not against the use of the step wedge or the densitometer, anything of the kind. He thought there should be perfect colour but having obtained a set of numbers it was for the colour photographer to work on his production achieve something which was more than the literal transcriptio thought that there should be technique, and then, superior to that, some other characteristic quality of the artist himself.

Mr. COOTE, referring to what Mr. Milner had said about the value of texture of the finished print, whether a good reproduction of an old master (which would always have the same surface regardless of texture of the original) was worth the term "art."

Mr. MILNER thought that a reproduction could deserve the term "art." As for texture, only emphasised it because it was to produce quality.

Mr. COOTE took the example of a water-colour with no unusual texture, either in the original or in the reproduction. Surely, in the reproduction the copy might be indistinguishable from the original, and both regarded as works of art.

Mr. MILNER said a copy should not be a work of art, but it should lack the extra quality. There were some excellent reproducers in the colour industry who could produce facsimile copies of paintings which were sold at two to three guineas in the print shops, but no one would regard those reproducers as artists.

Mr. COOTE thought that it was nevertheless, he said that the value of their work was a work of art, but it was back to the original artist.

Mr. MILNER was doubtful whether the artist himself would say so.

The CHAIRMAN remarked that a large number of reproductions were made in galleries.

Mr. MILNER still maintained that the credit went to the first artist. There were many people who could copy by sheer skill, but that did not entitle them to be called artists.

Mr. SCOTT BUSHE said that the question suggested that the man who did the copying was an artist, and the question was whether the copy produced was a work of art.

The CHAIRMAN said that it might be useful, perhaps, if the d

ght out a little more fully the ion of where artistic control d come in photography. One might arrange the subject and ighting in front of the camera. s quite conceivable that another might make the print, and Mr. r himself had said that there very considerable control in the stage. Art could surely be duced at that stage. An ic atmosphere could be introd in the arrangement and ing of the subject itself. There those two artistic steps in r photography, one in the al exposure, and the other at printing stage. Which of these the more important? And what d be the result, so far as their ition of terms was concerned, if first of those stages was carried by one individual, and the ad stage by another?

r. MILNER considered that the merit went to the man who posed and arranged the picture. r. JOHN CHEAR thought that the merit went to the man who saw ight view from the very start. r. HENNING pointed out that the who had a creative idea, might now how to tackle the production. He thought of several men in film world who had ideas, but had no knowledge of the means limitations imposed, so that ideas had to be worked out by rs, and those others might, rtheless, be artists and do tive work. Somerset Maugham, ne of his novels, portrayed a actor who was trying to paint and asked one of the critics whether hought he was any good. The r elucidates the whole problem: n't ask me that, but answer me, ou feel that creative urge—that e within—either to do what you or to commit suicide. If you do feel like that, you can leave it e, you are not an artist."

r. CHEAR said that in the case of tography the technical part was f a piece with the limitations of medium. The art must come in re that.

r. WACE said that Mr. Milner the combination of an artistic d and a facility for good technique judge from the results he had wn them. He himself was quite a inner in this work, but he did feel t apart from the original picture re were some means of varying technique in certain directions ch would give a better and e artistic result than the literal sscript of the scene before the era.

OLONEL SYMON pointed out that medium they used was much more

sensitive to variations in colour than the eye, and, therefore, there would always be a difference between the scene as the eye saw it and as it was strictly rendered on the colour film.

The CHAIRMAN said that he thought this was all a matter of technique, and if one trained oneself one could see these more subtle things in Nature, which the camera was so quick to pick up.

Mr. JEFFRES asked whether the painter of a portrait, painting a subject under a tree, would ever paint the face green, although a study of the actual subject would show that as a result of reflection the face was actually green.

Mr. MILNER replied that any artist would immediately react to such an emotional aspect of colour, even to the point of exaggerating it.

The CHAIRMAN remarked that even art was commercial, and the painter had to consider the susceptibilities of his sitter.

Mr. COOTE felt that the fundamental question, where art came in in colour photography, whether before the original exposure or in the latter stages in the printing, had not yet been settled.

The CHAIRMAN, in summing up the

discussion, said that he thought it had brought out all the basic points, and there was now some tendency to get down to the question of dodges in technique and whether they were or were not art. He felt that they had gone about as far as they could usefully go at this stage, and he wanted, on behalf of those present, to thank Mr. Milner for getting this discussion going, because, whether they agreed with him or not, he had been provocative and had inspired many interesting ideas. He thought that in general they had decided that colour photography could be art, though that was not to say that it was art at present. It was up to them to see that it developed along those lines and to keep that artistic motive in the forefront. At the same time, it had to be remembered that colour photography had been purely a technical pursuit with many of them, and there was very good reason why it should be. But after one had passed a certain point of technical acquirement, one began to consider the artistic aspect, and the discussion that afternoon had given them something to ponder along those lines.

A vote of thanks to Mr. Milner was accorded by acclamation.

IS COLOUR PHOTOGRAPHY AN ART?

By Darrel Catling

Is colour photography an art? Well—as Joad would say—it depends upon what you mean by Art!

There has never yet been a definition of this term which is completely satisfactory to everybody. I suppose the same thing applies to the definition of any other term—except that there's not such a universal *interest* in other definitions as there is in that of Art.

However, unless one gets hold of a definition that at least satisfies oneself, it is impossible to conduct such a discussion any further.

In that case, here's mine: Art, if nothing else, is a rearrangement of natural phenomena into a new, and significant form. Perhaps you may prefer the expression, creation—or recreation—instead of rearrangement. Be that as it may, art must be something man-made; a sunset is *not* art, but man's rendering of it on canvas *is*. It may be bad art or good art—but nevertheless it *is* art. In that sense, of course, almost everything made by man is a work of art of some sort, so we therefore use the expression "fine art" to denote the stricter sphere at present under discussion.

To belong to the group of fine arts, then, a medium must allow sufficient

opportunity for the re-creation of life into a unique and significant form.

That there is in any photograph (be it in monochrome or in colour) a considerable rearrangement of life, nobody can deny—for photography, however hard it may try, cannot produce anything like an *exact* copy of life.

A photograph may be in colour, it may be stereoscopic—in the case of a film it can be in motion—yet it neither possesses the limitless area of the universe itself, nor can one walk into, or round the back of, a photograph in order to see what's behind some object displayed in it.

Moreover, the extent to which photography allows for the conscious and purposeful rearrangement of life is considerable.

If, however, these opportunities are not taken, it is not the fault of the medium; we can only blame its artists.

Now, if the rearrangement of life into a new form is only partial, the degree of creation (and, therefore, the degree of art) is only partial. Consequently, the greatest significant re-creation produces the greatest art.

I think most people would readily agree that photography allows for a

sufficient degree of rearrangement (and control over that rearrangement) for significant works of art to be produced.

Significant, certainly, but are they original? Are they unique? Or is it a fact that the graphic arts can achieve works that are virtually similar?

Well, the answer is that, in the main they can, but that when painting apes photography, it is straying far from its true field as when photography apes painting.

However, where photography really comes into its own, and enjoys a field unattainable by any other medium, is in the art of capturing the split second. When this field ceases to be used almost entirely for scientific analysis on the one hand, and for stunt effects on the other, the art of photography will make a new spurt forward—especially if colour photography gets into this field as well.

So far I have scarcely mentioned colour, because I have been chiefly concerned in proving that photography, of whatever kind, is an art. Colour photography—by introducing another element with which we can alter life to our requirements—might well be considered as even *more* of an art than monochrome photography: provided artistic control is exercised in the handling of the colour. However, regarding both colour movies and colour stills, the number of really good artists who have emerged is very small.

I think part of the trouble is attributable to the fact that most colour practitioners are scientists—or semi-scientists, at any rate. And the artist who would like to work in colour is appalled at the amount of practical knowledge he is called upon to acquire, and promptly gives up the ghost. This state of affairs results in many colour prints being technically excellent, but artistically unimaginative. However, I believe that in America this difficulty has been overcome by the scientist and the artist going into partnership.

Yet, assuming that a good artist in monochrome photography tacks himself on to a "colour scientist," it is highly improbable that good results will turn up—for the chances that our monochrome photographer will understand colour are very remote.

One great drawback seems to be that the "artist within the photographer" immediately withdraws when confronted by colour, and the photographer contents himself with attempting to portray life as she is, in natural colour. In other words, he is afraid to take liberties with colour, and to let his imagination have full rein.

Yet he must, above all else, use his

colour with restraint, and try to achieve a harmonious balance, which often results in a considerable rearrangement of the subject matter. It really is necessary to possess an understanding of colour before one can expect to succeed in this medium. That is why, in America, Ivan Dmitri has done such good work; before taking up colour photography he was

already a graphic artist in a way. There is, to my mind, no doubt of the value of colour photography—both moving and still—is an art, but I'm convinced that it's a much more difficult than black-and-white photography. However, not until more real colour artists are liberally mixed up with the welter of scientists, will we realise the existence of this art!

FLICKER IN 16 MM. PICTURE PROJECTION

The undernoted conclusions are reached by E. E. Masterson and E. W. Kellogg in "A Study of Flicker in 16 mm. Picture Projection," contributed to the October, 1942, issue of the *Journal of the Society of Motion Picture Engineers*.

"It seems to be generally accepted opinion that three-blade shutters must be employed to control flicker properly in the projection of 16 mm. pictures, even though the machine is not required to operate at less than 24 pictures per second. There is little complaint of the flicker in theatre projection, where two-blade shutters are practically universal. Why then should it be necessary to make a large sacrifice in screen brightness by using three-blade shutters when projecting 16 mm. pictures? Less control of the conditions for projection is probably the most important of the valid objections. However, the opinion that two-blade shutters are not to be considered is based in part upon misleading tests, and the writers hold that for many applications single-speed machines should be given the benefit of the greater luminous efficiency possible with two-blade shutters.

The paper discusses the various factors that bear on flicker, and reports a number of experimental studies."

In the paper it is stated that "the obvious explanation of the prevalence of three-blade shutters in 16 mm. projectors is that the machines are designed for projecting pictures at either 16 or 24 frames per second. In view of the vast number of silent 16 mm. films, made at 16 frames per second, it seems clear that general-purpose projectors for a long time to come will have to meet this requirement, and there seems to be no satisfactory solution to the flicker problem at this picture frequency except to use three blades. On the other hand, the increasing use of sound projectors is unquestionably bringing a market for projectors that will have to operate at only one speed. Under these

conditions, it becomes a question of considerable importance whether it is necessary to provide these projectors with three-blade shutters. The loss of between a quarter and a third of the available light is as if it is not necessary."

"... the general conclusion of our studies is that the decision to employ three-blade shutters for general purpose 16 mm. projectors under conditions of use can not be predicted as entirely justified. Projectors with three-blade shutters and with incandescent lamps can, if provided with efficient optical systems, illuminate a 3x4 foot screen with 10 foot candles. Hence, with screens of this size or smaller, two-blade shutters are not recommended as giving a better picture. On the other hand, projectors that are designed for use for showing to fairly large audiences, where screens five feet or wider are desirable in order to make the picture easily seen from remote seats, should (if they are equipped with arc lamps) preferably have two-blade shutters in order to obtain the benefit of the brighter picture."

THE WAR-TIME FILM INDUSTRY IN CHINA

Motion picture projection is common in China under the most hazardous conditions of war, it is revealed in a paper by T. Y. Lo, contributed to the December, 1942, issue of the *Journal of the Society of Motion Picture Engineers*. The industry has literally to go underground. As protests against the Japanese bombing of laboratories and editing and sound compartments are built in tunnels deep as thirty feet below the surface. At the alarm the equipment is hurriedly packed into the dug-outs. Actors and directors go on with their rehearsals while editors and cutters continue their work to the hum of the approaching raiders. Thus projection to-day in valiant China.

ADVANCE OF 16 MM. FILM

By Andrew Buchanan

meeting of the Kinematograph Section of The Royal Photographic Society, held on the 18th May, 1943, at 16, Prince's V.7., with Mr. G. C. Weston, F.R.P.S., in the chair, Mr. Buchanan gave an address on "The Advance of 16 mm.

BUCHANAN said: I am very glad to have this opportunity of talking to you, and most of you come within the category of actual film-makers, and the theme is based on the advance of 16 mm. production in the future, and the importance of the amateur. The fact that I have been asked to give this lecture on professional films for many years, and, consequently, have been exclusively with 35 mm., I have built this lecture on 16 mm. film, for I attach importance to it in many ways in the future, and also have been very closely connected with it. My first experience of amateur production was when I was asked to act as Adjudicator at the Glasgow Film Festival, some years ago, and later I adjudicated at amateur film competitions. From these I realised that a professional can learn a great deal from the amateur, just as, of course, the amateur can learn a lot from the professional. Indeed, the difference between the amateur and the professional is a material one only, and is, therefore, secondary, and not fundamental. Generally speaking, when I speak of film-making, I mean *all* film-makers, whether professional, for all have been within the limits of their resources. I have seen amateur films for a few pounds each, which contained more originality than professional productions, and, from possessing or lacking the necessary equipment, it is the difference in film-making which really counts. Here the amateur may have an advantage over the professional, as he has no need to produce films to a commercial formulae. The recent advance of 16 mm. film is remarkable, and of the greatest significance. A few years ago amateur groups were using 16 mm., a great governmental propaganda, informational and educational films are in circulation on 16 mm., though produced, in the past, on 35 mm. This advance of 16 mm. for the profes-

sion of subjects of the greatest importance should make the amateur conscious of the future possibilities of the medium he has made his own, and it is essential that every film he makes should really matter.

Remember that a few years ago no one dreamt that a vastly increased output of documentary films made by the finest units in the nation would be for distribution solely on 16 mm. stock—and it is just this linking of the professional and amateur producers by providing a common ground in 16 mm. which is going to have important results in the post-war world.

I feel quite sure that 16 mm. will be the medium of the future in the great non-theatrical field which is fast developing, and this being so, it behoves the amateur to approach film-making seriously whether it is "just a hobby," or preparation for entry into professional production.

And here I would say that the fact that this Society has established a 16 mm. section is significant, for when I first began talking seriously about films fifteen years ago, few, if any, important groups of thinking people were regarding the screen with any degree of importance, and yet to-day, as here, the finest brains in the world are concentrating on film as perhaps the greatest medium for projecting enlightenment, and for linking the nations together. It is not from the world of commercial film-making that we should expect evidence of fundamental progress in film-making, but from the ceaseless thought and experimenting of serious-minded bodies, who are able to approach the art as craftsmen, forever exploring its technical, artistic and informational possibilities.

That brings me to an important point. It is highly probable that a photographic artist—that is, a maker of still photographs—who now possesses a cine-camera, will instinctively approach moving pictures more or less as he has for so long approached still photography. When he was making his lovely photographic pictures he was expressing himself fully, and, therefore, he will probably

begin film-making photographically, being content with photographic standards of perfection. I suggest that is wrong. At the other extreme, is the person who, with a considerable knowledge of still photography, becomes so absorbed by the actual *technique* of film-making that he forgets the basic requirements of the screen, foremost amongst which is *movement*. That approach is also wrong. On the one hand there is the photographer making films photographically, and on the other the pure technician. The human touch, which it is so essential to capture on the screen is usually absent from the films of both these "extremists," and so it is most necessary to steer a middle course, for though film-making demands both photographic and technical qualifications, a highly developed "film sense" must govern each of them, as we shall see.

If film-making has developed out of a love of photography and so began as a hobby, there is no reason why that hobby should not be a productive one in the best sense of the word, and, above all, if success is aimed at, it is imperative that it should *remain* a hobby to the end. Once a man's hobby becomes his profession or trade, it is in danger of losing the inspirational fire with which he first endowed it.

Every great artist's work began as a hobby, but it *remained* his hobby throughout his life; because of that he has retained his enthusiasm, his freshness of outlook, and the exciting feeling of always being on the verge of discovering something new. Because of that, the great artist achieves artistic success, whether his medium be paint or marble, prose or poetry, stage or screen.

With the tremendous advance of 16 mm. film, the cine-camera has stepped into yet another new sphere, and bestowed upon the amateur countless opportunities for proving his ability. He must begin to see further than his family circle. That is, even though his film may be but a cameo of his own family's normal home-life, it must be produced with the kind of ingenuity and filmic skill which will ensure that it will hold the interest of an audience unrelated to his family circle. Indeed, that is the test. He must be able to grip the attention of people he has never met. That is the job of professional producers. It must also be the task of the amateur if he is to advance.

I repeat, the professional looks to the amateur for progress in film-making, and this is the reason. The amateur possesses something which the professional can never hope to obtain—*Freedom*. Amateurs do not

away, realise that many professionals spend their lives languishing in commercial prisons, and long for the freedom of the amateur, who can make what he likes, when he likes, and how he likes. Therefore, it is of vital importance to see that this precious freedom is used to the best advantage. And that brings me to the actual making of films, and the right way to approach the job. First, never assume that one can judge a film by its cost. Whether it has involved thousands, or just a few pounds, it may be a work of art or a failure. Whether it be humble or gigantic, it is the ultimate result of a number of complicated processes, all of which are interdependent, and the successful film-maker needs to possess a thorough knowledge of each one of these processes or operations instead of being content to become a technical specialist in one particular branch.

The first essential is to regard the screen as an empty canvas, and not a mere space upon which one intends to mechanically project a roll of film. To regard the screen as a canvas forces one to regard one's creative task differently, and in the following manner. If I was discussing the subject with an individual amateur who possessed the right equipment and who was ambitious and eager to begin, I should advise him first to regard his camera and all its fascinating gadgets as of quite secondary importance, and I should warn him never, for one moment, to permit his apparatus to become master of the situation. Once equipment dominates the scene, and governs production methods, the result will lack human creativeness. Next, I should tell him that the first and last essential in moving pictures is *movement*. Strangely enough, thousands of people overlook this basic fact, and many producers make ambitious and costly films which, *filmically*, do not move at all. The function of film is to tell its story in terms of moving images, and not to rely upon human speech to explain the action. Film is an independent medium, unrelated to the stage or literature, and it demands a special technique. The test of a great film is the smoothness of its pictorial movement, and the clarity of its message, explained solely by moving images.

The coming of talking pictures has retarded the progress of film, for speech is a barrier to movement, and urges the producer to rely on dialogue instead of pictures to provide the narration. Now there are three forms of movement: first the movement of life before the lens;

second, the movement of the camera itself; and third the *fundamental* movement created by cutting. Reverting to the first form the fact that the film-maker is able to capture *mechanically* the movement of people passing in front of his lens is not enough to justify the claim that he has made a moving picture. Second, the temptation to create movement by making the camera move all over the place is not recommended. I am weary of the inevitable shot which crawls tremblingly over cathedral roofs, across vast expanses of distant downs and up and down streets. To begin with, keep the camera stationary. Only after long experience should one seek to make it travel, *imperceptibly*, over the objects being filmed. And as for the third form of movement, created by cutting, therein lies the key to real film-making, for it is on the bench of the cutter that lifeless, meaningless strips of film become welded together to form a dramatic unity, infused with pictorial rhythm. I will refer to this all-important work in its right place. For the moment, though, let us be content with realising that *movement* is the first essential, and that it emanates from three sources. Next, we need to learn of the several distinct processes through which a film must pass from its conception to its completion. None of these processes can be skipped, and one needs to be skilled in each. To begin with, the foundations of a good film are built on *paper*. I would go further, and urge the film-maker to lock up his equipment, forget it, and sit down to produce his film only on paper as a start. Naturally, a film begins with the birth of an idea. Then follows the treatment, which evolves into the scenario. To this is linked camera technique, governed by skilful direction. Finally, the results reach the cutting stage.

The idea for a film can, of course, emanate from countless sources: incidents at home, in industry, on holiday, or even from a glimpse of some incident read about, or seen when travelling. Perhaps one of the best lessons is to endeavour to make a film, at first on paper, of the town or suburb in which one resides. It is surprising how this forces one to *analyse* one's surroundings, and to see familiar localities from an entirely different viewpoint, as through the eye of the camera. Assuming this is being done, from the first roughly-noted "survey," one then prepares the treatment, which is merely a non-technical synopsis, the chief characteristic of which should be perfect continuity.

A treatment should be written and

re-written until the action itself is as smooth as flowing water, the sequence merging into the next, the writing of the treatment with the author the need to plan so that it will sustain interest from start to finish. Sequences must be in power until the climax is reached at the end. Badly constructed often begin with a climax! These foundations for a film, thrilling, perhaps, as rushing a camera and shooting anything one sees, but such foundations are essential to proper film-making. This is why I stressed the need to "duce on paper" to start with only when one is absolutely sure the treatment narrates a story which will hold attention throughout. One contemplates advancing next stage, which is the transfer of the treatment into terms of images—in other words, writing the scenario.

A lot of terrifyingly good nonsense has been written about scenario technique, but it is discounted, for, apart from the basic film requirements, it should be written by and for those who will film from the start. They should be as simple as possible. The amateur scenarist will also be the director of the film, unlike the professional scenarist who might never see the director in the studio wherein his scenario comes to life. The first qualification for writing a scenario is to be able to move images, using them merely as a means of communication. A scenario should never be written as a literary undertaking. It is, or should be, a catalogue of shots in chronological order. Immediately a scene is completed down to the last shot, being composed of countless little things which together tell the story: the task of breaking it down into scenes. That is, reassembling scenes in *order of shooting*, always a bewildering job at first, as it does reveal a significant fact about film-making, namely, that it is essentially fragmentary, composed of seemingly disconnected episodes. As soon as shooting begins, continuity disappears, for the scenes are grouped according to time or scenes, for convenience, are filmed "out of order." But the man who is visualising the film in its final form during this shooting is the director, who plans the place of every scene. A great believer in film-making governed by one creative person, a person who conceives the film, writes the scenario, directs the picture, and then cuts it

eur often adopts this ut in professional film- is rarely the case, and so y polished and technically lms lack "personality"— ality of one governing saw the job through from sh. Shooting hundreds of f order, without apparent e to the other makes it for characters to "build arts, as on the stage, and r a director who is also t becomes evident.

an be very distracting to eginning film production, gmentary nature of film- a real and constant diffi- e student unless, side by he "break-down" version t, the scenario is always so that the original order n be referred to. In brief, r must be able, at every see each scene in relation e.

ow turn to the camera. d it as a *puppet*, and not a : should not be used to isplay of technical magic. a audience should be i of the work of the hat is, do not permit rk to distract attention ry being narrated by the anyone with a photo- se can learn to operate a t there is a fundamental between *taking pictures pictures*.

rtant thing is to learn the f the camera, which has ulty of the human eye— of selectivity. For

one approaches a village, on the threshold, one sees ce numerous contrasting e winding street, trees, spire; on one side, stream, on the other, a shops. Actually, those not seen in one glance, ries of lightning glances, itating a change of focus in instinctive and uncon- ation. Now the camera he village in the same way le position. At least six sitions would be required hat the eye saw more or h.

film that village success- im should be not merely i series of charming long film equivalent of a ost card views, but to idience feel it is really in walking up the street, o the shops, studying stone-carving of the sting the quaint charac- cottages, noticing the

ancient roofs, the cobble stones, *feeling* the unchanging atmosphere of the place.

A man who is really *observant* will obviously be more successful at this type of work rather than an artist in photography, or a skilled camera technician, although if he can borrow from both these experts, so much the better. I mention the fact here because many film-makers whose chief qualification is to have mastered the camera are drawn to "scenic" films, and approach villages and beauty spots by studying them through a viewfinder, instead of with the human eye. Make the camera inquisitive. Force it to magnify the points of interest you have discovered, and mention of discovery leads me to the question of direction and the necessity to develop an ability to control every aspect of production. The personality of the director should pervade the entire film in the making, and make itself felt in the finished picture on the screen. Consider, for a moment, how commercial considerations have made it difficult for the "one-brain" film to develop. A director rarely thinks of the idea from which the treatment of his film emerged, and only in a very few instances is he the man who wrote the scenario. He has rarely, if ever, manipulated a camera—in most cases he could not do so. And he does not usually cut his films. He is probably a brilliant director in spite of this, but it explains why you will often see a picture, which, as I have said before, is excellent to look upon, yet which seems to lack something. What it lacks is the dominating *personality* of the director. That is not necessarily to be counted against it from a commercial point of view, because such a picture can still be a very great success, but it lacks that creative touch which can be introduced only when one man has conceived a film, and seen it right through to completion.

Amateur film-making has no need to experience such difficulties, for the amateur director can control a unit small enough to permit him to be the sole creator of his film. He needs, therefore, to know the qualifications a good director must possess in addition to his technical knowledge.

He should be a sympathetic, sensitive person, essentially patient, and although he will be shooting to a scenario which he probably wrote himself, he should also be forever on the lookout for opportunities to strengthen his sequence by adding little incidental shots of occurrences which could not have been anticipated at the writing stage.

That is, he must be ready to take

advantage of unpredictable events. Consequently, a script needs to provide room for incidental shots, and the author-director-cutter will know exactly where to insert them in the final assembly. It is by the introduction of such shots that a film expresses the individuality of its creator, and becomes something more than a carefully shot picture which has never once deviated from written instructions.

People who appear in amateur films come within two main groups, namely, those who normally perform the tasks they are shown to be doing, and those performing unusual tasks especially for film purposes, but both need careful handling to reduce camera-consciousness to a minimum. Moreover, the director should infuse his personality into each of his characters, for everyone on the screen is, or should be, a reflection of the director himself, who is responsible for the naturalness of individual performances.

By the way, when shooting, plan to avoid pictorial jumps in action. See that the action in the long shot terminates so that it will fit exactly the action which begins in the close-up to follow. It's surprising how often film-makers fail to match action and then wonder how to create smoothness on the cutting bench. If such blunders are made, and two shots will not match up at all, introduce the incidental "cut away" scene. That is, insert a shot distinct from, though directly related to, the action in the two strips which can't be matched. Here is a simplified example. Two old men are sitting outside an inn. They are seen in long shot, and both have their hats on, as they sit drinking. In the close-up which follows, one man is *without* his hat. He probably took it off during the period when the camera was being set up in the second position. It is impossible, therefore, to join the long shot directly on to the close-up. Overcome this difficulty, then, by cutting in, say, a close-up of a cow looking over a gate, and probably licking her lips (at the sight of the men enjoying their drinks). Do not *force* such shots into a film. Insert them as if they were *intentional* in the first instance. Filmic movement will be created when the scenes are being assembled and cut.

Cutting is a manipulation of film strips, and it is a highly skilled task. I always liken film cutting to the work of a sculptor who, chipping away, inch by inch, gradually brings stone to life. The importance of fine and delicate cutting should never be overlooked. It is by no means a

question of merely joining strips together, but of *creating* speed of narration by the manner in which strips are assembled. Cutting is a craft, capable of misrepresenting actuality. Therein lies its power. Here's a simple example. Let us suppose a shot is taken of a man whose face bespeaks horror, staring downwards. Cut the strip in half, and insert a close-up of a mouse. Immediately the situation becomes ridiculous—strong man afraid of mouse. But if, instead of a mouse, one cut in a snake, the man's horror becomes logical. The fact that the man's close-up could have been shot yesterday, and the shot of the snake four years ago, shows how, with entirely unrelated strips, *one can create a unity*. Creating filmic effects thus ultimately depends upon the skill and ingenuity of the cutter.

Creating pictorial parallels should be practised diligently, for by such means one achieves smooth transition from one sequence to another. There is a noticeable absence of the use of pictorial parallelism on the screen, but care should be taken not to introduce exaggerated examples, for the audience should be carried *unconsciously* from one phase of activity to another. Here are some parallels: dainty fingers picking chocolates from a box, followed immediately by less dainty fingers picking potatoes from a basket. A close-up of a screaming woman, followed by the piercing whistle of a train coming out of a tunnel. Nails being polished with a buffer, left to right—floor being scrubbed with a brush, left to right. Stoker shovelling coal into a furnace. Man shovelling food into mouth. But these parallels must appear to be inevitable, and should not be forced, or they will distract from the narrative and disturb continuity.

Lastly, one has to consider what types of film one should make. Documentary or fictional? The function of the documentary film is to present a dramatic interpretation of reality. To dramatise does not mean to falsify, but to intensify normal action. To bring vividly to life the activities of the town in which one lives, or the factory in which one works, and to relate such activities to the contemporary scene as a whole. All activities are interdependent. The cargo boat, the market, the grocer's shop, and the cooking stove. The craftsman and the mass-producing factory, the tobacco plantation and the cigarette-making machine, etc., etc. Future possibilities for the 16 mm. producer are limitless. He will have opportunities of using the medium for industrial,

scientific, medical, agricultural and religious purposes, and the accessibility of colour will further strengthen his results.

I regard the comparative absence of sound recording equipment in 16 mm. amateur circles as a *distinct advantage*, for although the talking film has swept the silent film off the commercial map, most documentary films are basically silent in technique. That is to say, most of them are composed of mute shots in the first instance, and absence of recording gear forces the amateur film-maker to produce his story in terms of mute moving images, and not to depend on dialogue. The basic approach to film-making is via pictorial action, and not verbal explanation. In the future, *direct dialogue*, which has reduced film to a national medium of expression, will be superseded by *sound*, which is internationally understood. Sound and music, woven together, will replace speech, and will accompany moving images. It is to this end the amateur should work, relying solely on his "picture" sense to tell his stories.

The amateur, free to experiment, and the professional, shall, by their combined contributions, reinstate film as an *international* medium of expression, the mission of which shall be to link all the peoples of the world together, instead of stringing them apart. The silent film speaks all languages. Sound and music are universal. Here, then, are the media to be welded together to enable all nations to speak to each other, and, through films, to reach understanding and peace.

Discussion

Mr. S. SCHOFIELD said that he had much impressed by the talk w. Buchanan had given, and he would like a word in defence of the amateur of the preparation or non-preparation of. Most amateurs had rather slender means were in the habit of saving up all the year until their holiday. In these circumstances was very difficult to prepare a script other hand, there were amateurs who prepared, with the help of other amateur clubs, for a story film. These must write a script, although, perhaps, some of them in and produced a film of this type without a script. But when working with a script used only about half the film in shooting one used without it for a film intended of same length. With a script it was possible to time the sequences, otherwise the film run much too long, and perhaps half had to be cut away. The script was in if one sought to economise in film stock.

He applauded the suggestion of a re-shots. These were very interesting occasions useful. A very ordinary picnic, or something like that, could be up if, right in the middle of it, one had a little humorous or fantastic counter. The whole thing could be made infinitely interesting by means of such by-play, could most usefully be done by having lecturer had indicated, an incidental b

Vote of Thanks

The CHAIRMAN said that Mr. Buchanan to be congratulated on giving the exactly what it wanted, and he believed when this address was printed in the *J* would prove most useful to amateur photographers. He moved a hearty vote of thanks to Mr. Buchanan.

The vote of thanks was accorded acclamation, and the meeting terminated.

TECHNICAL PROGRESS IN THE U.S.S.R.

In the *Journal of the Society of Motion Picture Engineers* for June, 1942, a lecture by G. L. Irsky, on "Technical Progress in the Motion Picture Industry of the Soviet Union," is reported. It describes how, ten years ago the young Soviet motion picture industry was merely in the embryonic stage and had no basic technical facilities to cope with the problems inherent in the new industry. At present there are factories in the Soviet Union producing equipment, films, and accessories for the motion picture studios and theatres. In recent years many studios have been rebuilt and adapted for sound motion pictures and a number of technical problems connected with it were solved. There are at present about 40,000 motion picture in-

stallations equipped with double projection machines. Eighty per cent are sound.

Motion picture installations of many varieties. In addition regular motion picture theatres in order to meet the demand of village and collective farm. Their own motion picture installations a great number of portable equipment for transporting both equipment and film from place to place are available. Some localities having no electric power equipment must be transported. The average number of films made from each new film is from 1,000, and often this is not sufficient. A special technique for the care of prints has been devised, making it possible to increase their runs from eight to ten times.

THE THINGS OF INTEREST FROM VARIOUS QUARTERS

SNOWDON PANORAMA

January, 1941, issue contained a stirring article by Mr. A. van R.I., "Plane perspective and all perspective compared in to 'photogrammetry,'" in which he described the advantages of the method which he had for projecting such perspectives.

The current issue (July, 1943) of the admirable quarterly, *The Lantern*, he describes some work which he undertook in company with a painter named Tom van Oss, who has been killed on active service.

Referring to the craze of the early years for huge panoramas of subjects as Niagara Falls, the Siege of Paris, which were played in large buildings and especially erected for the purpose, Mr. van Anrooy describes how he invented his method of making panoramas in small compass, attracted to the idea of making a panorama.

"Surprising," he writes, "that no record of any panorama of the Sh Isles, so rich in magnificent varied scenery." He says:—

"Choice was not difficult. Reasons left no alternative summit of Snowdon. It is accessible by the mountain from Llanberis. At the summit is not only shelter, but hotel accommodation for a stay of weeks. From these considerations, the mountain is steeper than the roof of a fording distant views of sea level, including mountain tops of the Isle of Man and Cumberland and in addition awe-inspiring cliffs and precipices, almost all over a thousand feet. No mountain provides these con-

ditions. You can imagine a peak even higher than Snowdon, but having at its base a more or less flat plateau 100 feet across. The artist can see from the centre a trip only of hills and dales in the horizon. Three-quarters of the interesting and impressive features would be hidden by a bald ridge. (The cairn on the summit is an artificial erection of stones one of the principal

Triangulation Stations of the Ordnance Survey.)

"Beyond this, Snowdonia is one of the most venerable geological sites in Europe. Certainly none is more engrossing.

"Early in July, 1939, we set out for our preliminary survey, having as our object the accurate placing, expressed in degrees of the arc, of the salient features—mountain tops, lake levels and so on. It would have been foolish to disdain the aid of photography, systematic photography, of course, not haphazard. An ordinary hand camera had to be converted into a home-made photo-theodolite capable of taking from one single point a series of twelve photographs together comprising the whole horizon, and all properly levelled. We made ourselves, in addition, two rudimentary theodolites of 3-ply wood for drawing by hand a small section of the panorama, if only to ascertain how far this method fell

below the accuracy of the lens. These things and other paraphernalia were packed into a ponderous suit-case that excited the merriment of the booking clerk at the Llanberis mountain railway station. On the platform we entered into conversation with a Japanese family. Spectacled and grinning papa with high-class Zeiss camera, mama shy and silent, and a delightful girl of about ten. Along with our suit-case, that conversation was to excite suspicion.

"At the summit there was a strong wind and visibility was often nil. Nevertheless, the hotel staff hoisted a table to the top of the cairn, well above the flat roof of the hotel, and firmly fixed it with bits of slate and rock. With the suit-case and four bricks, we kept the table edges from intercepting the view. The base on which the camera was pivoted had been fairly accurately divided into twelve sectors of 30 degrees each, and numbered from 1 to 12. As the sky cleared the camera had to be turned to sectors No. 5, No. 11, No. 8, No. 1, until, after a freezing two hours' operation, the twelve exposures were completed. If the weather had been clear, the twelve exposures would have taken less than half-an-hour. But, since the sky cleared fitfully, now here, now there, I had, with long

R.P.S. ANNUAL EXHIBITION

The 88th Annual Exhibition will be held at the Society's House, 16, Prince's Gate, S.W.7, from Saturday, September 4th, to Saturday, October 23rd, both days inclusive.

The President and Council request the honour of the company of the Fellows, Associates and Members and their friends at the Private View at 16, Prince's Gate, S.W.7, on Friday, September 3rd, from 3 p.m. to 6 p.m.

They are asked to accept this invitation as a measure of economy in the national interest in place of the invitation which in normal times is sent to them individually by post.

The Exhibition will be open daily from 10 a.m. to 5 p.m., and on alternate Sundays (i.e., September 12th, September 26th, October 10th) from 2 p.m. to 5 p.m. The Sunday opening is introduced in order to give Members and others who, on account

of their war work or through other causes, are unable to travel on weekdays, an opportunity of seeing the Exhibition.

The Lantern Slides accepted for the Exhibition will be shown on the screen on Saturday, September 11th, at 5 p.m.

On Saturday, September 25th, at 5 p.m., Mr. G. B. Mason, will lecture on "North Africa."

On Saturday, October 9th, at 5 p.m., a number of new Technicolor Travel Films will be projected.

The Exhibition will comprise Pictorial Photographs (prints and monochrome lantern slides); Colour Photography (prints and transparencies); Scientific and Technical Photography, including Photomicrography, Radiography, Astronomical, Geological and Metallurgical Photography, and Survey and Record Photography; Natural History Photography (prints and transparencies); and Stereoscopic work.

There will also be special exhibits demonstrating the Airgraph Service, Transfer Sensitising, and Mass Radiography.

intervals of non-activity, to turn the camera west, north-east, south, north and so on. Hence the task occupied about two hours instead of half-an-hour. The order of exposure had to be carefully registered. The Japanese photographer cast a contemptuous look at the camera, but, we thought, an envious one at the angle-measuring arrangement. But the weather was too much for him, and he went back down the mountain."

Mr. van Anrooy then describes in good-natured and amusing terms his experiences with the Japanese police authorities, who had been informed of their activities, the mysterious suit-cases they were carrying and the fact that they had been seen conversing with the Japanese, all of which had aroused suspicion among some onlookers. The police authorities treated them most courteously, and they had no difficulty in convincing them of their integrity.

He continues:

"With premonitions of war, we were eager to start the actual painting on the site, and when we returned, we had in the lounge, as the staying guests at the hotel, a first-rate studio with roof terrace adjoining. We looked down on roughly 16,700 square miles of land and sea, on innumerable heights lower than Snowdon itself, but seven of them over 3,000 feet and twenty-seven over 2,000 feet. Out of forty-two lakes, thirty were visible. Visibility was occasionally over 100 miles. It will be realised that 16,700 square miles is more than twice the size of Wales and larger than the area of Switzerland or Denmark."

Two remarkable photographs, showing the eastern and western aspects of the panorama, are among other illustrations accompanying the article.

It is satisfactory to know that photography was able to play so useful a part in this interesting enterprise.

Mr. Alexander Keighley

We referred last month to the Diamond Jubilee which Mr. Alexander Keighley, Hon. F.R.P.S., is celebrating this year as a photographer. He adopted photography as a hobby in 1883, and during his career he has acquired world-wide fame.

The following report of the celebrations at the Cartwright Memorial Art Gallery at Bradford on July 17th appeared in the issue of *The Yorkshire Observer* dated July 19th.

"High tributes to the services of Mr. Alexander Keighley in the inter-

ests of pictorial photography were paid at the opening of an exhibition of his work at the Cartwright Memorial Hall, Bradford, on Saturday.

"The exhibition, which has been organised by the Yorkshire Photographic Union, covers Mr. Keighley's photographic activities during the past sixty years, for twenty-two of which he has been president of the union.

"A souvenir album, containing an address acknowledging his services to the union and to pictorial photography generally, signatures of members of societies affiliated to the union, and records of outstanding events in his photographic career, was presented to Mr. Keighley.

"The presentation was made on behalf of the union by Mr. F. Atkinson (hon. treasurer).

"Mr. W. E. Gundill, hon. business secretary of the union, who presided, said the gathering honoured in Mr. Keighley a great artist and pioneer pictorial photographer whose reputation was international.

"Acknowledging the gift, Mr. Keighley briefly surveyed his photographic 'adventures' and mentioned that he had been a member of the Bradford Photographic Society for sixty years.

"The exhibition, he said, had revived memories of foreign travel and pleasant associations with people in many lands.

"Mr. F. J. Mortimer, hon. secretary of the London Salon of Photography, presented Mr. Keighley with an address from the members of the Salon. Mr. Keighley, he said, had the ability to recognise great subjects and to treat them in the appropriate manner. He was a perfect example of the saying that it is not the camera but the man behind it that counts.

"As a matter of fact," he added, amid laughter, "his camera is a disgrace. It is little more than a brown paper parcel."

"Yet, with that instrument, he had been able to produce the magnificent pictures on show. They were a complete answer to the question: 'Is photography art?' It all depended, of course, on whether the photographer was an artist.

"Congratulations to Mr. Keighley were also extended by Mr. W. J. Foster, president of the Photographic Alliance, Dr. J. L. Hankey, of the Manchester Photographic Society, and Mr. Bertram Cox, one of the founders of the Pictorial Group of The Royal Photographic Society.

"Mr. D. McMaster, President of The

Royal Photographic Society, opened the exhibition. 'It is in the United States many an exhibition at which Mr. Keighley's pictures always the centre of interest,' he said.

"It is people like Mr. Keighley who have brought pictorial photography to its present high level."

"Mr. McMaster mentioned that the exhibition would be staged at the headquarters of the Royal Photographic Society before the year was out."

Australian Airgraph Service

We have received the first airgraph letter from Mr. L. A. Wilton on the occasion of the extension of the airgraph service to Australia.

11, Wildon Grove, Myrtle
South Australia
5th July

On this, the opening date of the Airgraph Service for Australia, I am happy to convey to you my regards and best wishes for the future.

The Airgraph Service marks an event of importance in the history of photography, a history which, in spite of the misgivings of the camera owners throughout the world, is inclined to be taken more seriously than ever before. It is a service which, if granted, and but few give credit to the inventor or creator of it, will be of new, helpful and of service to the world in the immense amount of information involved in such matters.

So the Airgraph Service is perhaps but a few days' work, but undoubtedly it will also be a success and a public benefactor that we must be content, and let the photographic historians to

(Sgd.) L. A. WILTON
(Member of the)

Past President, Adelaide Club.

These good wishes are much appreciated and reciprocated.

One of the most interesting developments of the present war is the speeding up of communication by the aeroplane and photography, and this single factor is as important as far-reaching and in its consequences in the post-war as any of the many advances that have resulted from the war.

The rapid extension of the airgraph service to the most remote parts of the world will serve the exhibit explaining the war, which will be included in the Annual Exhibition, of particular interest.

The Film in National Life

It will be remembered that a conference on "The Film in National Life" was held by the British Film Institute in Exeter last April. The cinematograph Section of The Royal Photographic Society was represented at this Conference by Dr. H. Mandiball, F.R.P.S. The Conference was opened by Dr. John Murray, the Principal of the University College of the South-West.

Dr. Murray opened his address on a warning note:—

"When a thing is mentioned as having a place in national life, that is always suspicious. 'Education and National Life,' for instance, when I read *The Times* Educational Supplement, I find means 'What is wrong with education?' When I read about the public schools in national life I know that means 'What is wrong with the public schools?' Before a thing is given, or named, as having a place in national life, it usually means that some people, at least, think there is something terribly wrong with it, and that it wants clearing up."

The Conference included papers on Adolescents and the Cinema, Developments in Non-Theatrical Cinemas, The Psychology of Cinema-Going, and International Influence of the Film.

The paper on Adolescents was read by Dr. J. Macalister Brew, M.A., Education Secretary, National Association of Girls' Clubs, and that on Developments in Non-Theatrical Cinemas by Mr. William Farr, Head of the Central Film Library of the Ministry of Information. Dr. J. Stuart Smart, M.C., M.A., B.Sc., Director of Education for Acton, read and amplified notes prepared by Dr. Doris Odum on the Psychology of Cinema-Going, Dr. Odum being prevented by illness from giving her full lecture.

The Conference closed with a paper by Dr. Viktor Fischl, of the Czechoslovak Ministry of Information, on the "International Influence of the Film."

Discussion groups reported on "The Film in the Classroom," "The Film in Adult Education," "The Film and Civics," and "Film Appreciation." During the Conference the following films were projected:—

"This is Colour." Made by Imperial Chemical Industries, the film opens with a description of what is meant by colour.

"Peace River." Produced by James Beveridge and Michael Spenser for the Canadian National Film Board.

"World Garden." Made by Spectator Films for the British Council, and deals with the work of Kew Gardens.

"Colour in Clay." Made in Technicolor by Mary Field for G.B. Instructional, and sponsored by the British Council.

"Canadian Landscape." This Kodachrome film, sponsored by the Canadian Government, shows the actual working technique of an artist and the manner in which he produces the finished canvas from a rough sketch on the spot.

"All Those in Favour." Made by Rotha Productions for the Ministry of Information.

"New Towns for Old." Made by Strand Films for the Ministry of Information.

"We Shall Build Again." Made for Cadbury Brothers by Strand Films.

"The City." Sponsored by the American Institute of Planners through Civic Films Inc., and directed by Ralph Steiner and W. van Dyke.

"Life Begins Again." Made by Rotha Productions for the Ministry of Health.

"Control Room." Made for the Ministry of Information by the Shell Film Unit, and directed by Geoffrey Bell.

The following new and British-American documentary films were also shown:—

"Workers' War Front," No. 5. Production by Paul Rotha Productions in collaboration with all the companies producing documentary films, for the Ministry of Information.

"Young and Healthy." Production by Public Relationship Films for the General Council for Health Education.

"A Child Went Forth." Production by the National Association of Nursery Educators for New York University. Made by Joseph Losey and John Ferno.

"Summer on the Farm." Production by Greenpark Productions for the Ministry of Information. Made by Ralph Keene.

"Henry Browne, Farmer." Produced by Roger Barlow for the U.S. Department of Agriculture.

"Home on the Range." Produced by Tom Hogan for the U.S. Department of Agriculture.

"The Newt." Instructional film made by Mary Field of G.B. Instructional, for the British Council.

"Market Town." Made for the British Council by G.B. Instructional.

"Blood Transfusion." Made by Rotha Productions for the Ministry of Health.

The following film appreciation programme, drawn from the Loan Collection of the National Film Library of the British Film Institute, was also a feature of the Conference:—

"The Great Train Robbery." Directed by Edwin S. Porter for the Edison Co.

"Extract from the Cabinet of Dr. Caligari."

"Film and Reality," Part III.

"Papageno."

"The River."

The British Film Institute have published a report of the proceedings, copies of which are obtainable, price 1s. 6d. each, from their headquarters at 4, Great Russell Street, London, W.C.1. The report contains the papers in full, notes on the discussions and descriptions of the films.

Miniature Camera Group

Since the publication in our last issue of the lectures arranged by the Miniature Camera Group, a change has been made in the date and hour of the lecture to be given by the President, Mr. D. McMaster, F.R.P.S.

This lecture, "Problems governing the manufacture of precision miniature cameras," will be given on Tuesday, February 15th, 1944, at 6 p.m., instead of on Saturday, February 19th, 1944, at 3 p.m.

Film Salvage

An appeal has been made by Guy's Hospital, which warmly deserves the support of photographers, and we doubt not that such support will be readily extended by all who are in a position to respond to the appeal.

There is a great demand for film base as salvage, and it is urgently necessary in the national interest that it be met. The base has important uses in direct association with the war effort, and every film—not glass—negative that can possibly be spared is vitally needed. Readers need not refrain from responding to this appeal on account of any private or personal reasons, as the film image is utterly destroyed.

The general funds of Guy's Hospital will benefit from the sale of exposed films sent to it, and we are confident that an appeal on behalf of two such excellent objects as the provision of salvaged materials so vitally necessary to the war effort, and the support of one of the leading hospitals of the country, which, while it has itself suffered considerably from the war, has rendered such admirable service in alleviating suffering due to the war, will meet with a sympathetic response from photographers.

Will those who wish to assist these objects please send their used films to the Appeal Secretary, Guy's Hospital, London, S.E.1.

R.P.S. PROCEEDINGS COUNCIL MEETING

A Meeting of the Council of The Royal Photographic Society was held at 16, Prince's Gate, S.W.7, on July 12th, when the following were present: The President, Mr. D. McMaster, in the chair; Messrs. H. Baines, A. J. Bull, G. Scott Bushe, L. V. Chilton, A. E. Dent, Percy W. Harris, G. E. W. Herbert, T. Midgley Illingworth, J. D. Johnston, H. Bedford Lemere, Mrs. Rosalind Maingot, Messrs. F. J. Mortimer, J. H. Pledge, Ronald Procter, S. Schofield, Thomas H. B. Scott, W. Symon, F. J. Tritton, and G. C. Weston.

New Members

The following Candidates were nominated for Membership:—

Robert Barker, c/o 19, Court Orchard Road, Bridport, Dorset. (Member, Dorchester Camera Club).

Alun Beddoe-Stephens, 242, Gloucester Road, Cheltenham, Glos.

Treeby Bolton, Standish House, Lake Road, Keswick.

Jack Elliott Bown, "Penwalden," Tutshill, nr. Cheltenham, Mon.

Henry Everatt Brocksom, 56, Ridge Hill, Golders Green, N.W.11. (Member, North West London Camera Club).

Reginald George Bruten, 15, Agincourt Square, Monmouth.

B. Erle Buckley, 108, Park Terrace East, New York City. (Member, Miniature Camera Club of New York).

James Garnet Cowley, "Land's End," 47, Beechlands Drive, Clarkston, Glasgow. (Member, Glasgow and West of Scotland Photographic Association).

Bertram Cyril Cox, 40, Liverpool Road South, Maghull, nr. Liverpool. (Member, Liverpool Amateur Photographic Association).

George Thomas Crouch, Technical Representative, W. Vinten, Ltd., North Circular Road, Cricklewood, N.W.2.

Walter Anthony Curtin (Pte.), 13046251, 93 Coy. P.C., c/o G.P.O., Southampton.

Arthur Edwin Dadley, 46, The Mount, Coventry. (Member, Photographic Miniature Postal Portfolio).

Richard Willan Davis (Major), Waterton, Quakers Lane, Richmond, Yorks.

William Thomas Elston, Superintendent of Production, Creechbarrow House, Taunton, Somerset.

Reinholdt Eriksen, Norwegian Government Film Unit, Kingston House, S.W.7.

Harry Esterbrook, 38, Overpark Avenue, Leicester. (Member, Leicester and Leicestershire Photographic Society).

John Fairweather, Fountain House, Hockley, Essex. (Member, South-east Photographic Society).

Harold Bailey Floyd, A.C.A., "Headley," 38, Farnet Avenue, Purley, Surrey. (Member, Half-Plate Postal Club).

Gunner Fougner, Norwegian Government Film Unit, Kingston House, S.W.7.

Leonard William Fuller, 42, Castellan Avenue, Gidea Park, Essex.

Lester Garner, 65, Green Lane, Garden Suburbs, Oldham, Lancs. (Member, Oldham Photographic Society).

Joseph Percy Granger, Spring Chase, Eastwood, Notts.

Lloyd Middleton Hampson, M.D., Canadian Orthopaedic Unit. (Member, Glasgow and West of Scotland Photographic Association).

James Frederick Hardiman, Blue House, Somerleyton Avenue, Kidderminster, Worcs. (Member, Kidderminster Photographic Society).

J. L. Hankey, "Heatherlea," Marlborough Road, Sale, Manchester. (Member, Manchester Amateur Photographic Society).

Eiliv Odde Hauge, Norwegian Government, Kingston House, Prince's Gate, S.W.7.

Annie Louisa Hebden (Miss), 24, Harlech Terrace, Dewsbury Road, Leeds 11. (Member, Leeds Camera Club).

Gilbert Robert Horton, 85, Grange Crescent, Chigwell, Essex.

Hal Westbrook Hurst, "Tintagel," Weston Park, Thames Ditton, Surrey. (Member, Kingston Camera Club).

John James, M.S.R., 6, Melbourne Terrace, Liskeard, Cornwall.

David Robert Jones, P.O. Box 59, Jos, Nigeria.

William Richard Jones, 31, Crosby Road, Southport. (Member, Southport Photographic Society).

N. A. Kilgore (Dr.), 1625, Main Street, Houston, U.S.A.

George James Lake, 6, Parkstone Avenue, Horfield, Bristol 7. (Member, Bristol Photographic Society).

James Lamsonby, 51, Claremont Road, Bishopston, Bristol 7.

William Richard Lee, The Camera Studio, Nightingales Corner, Little Chalfont, Bucks.

Wilfred Lee, 4, Daventry Liverpool 17. (Member, I Amateur Photographic tion).

John Platt Little, 80, Ruskin Bradford Road, Wakefield
John Henry Luscombe, 58, borough Avenue, Ruislip
Eric R. Marshall, Willington Croston Road, Farington Preston, Lancs. (Member, Camera Club).

Edward Mernagh, "St. Austeington Road, Hayes, M (Member, Hampshire House photographic Society).

Frederick Moore, 9, Biddell Washington, Co. Durham.

Alfred Jack Morris, 5, Avenue, Muswell Hill, N.1

Donald Morrison, "Alasdair, sington, Newcastle-upon- (Member, Newcastle-up Photographic Society).

Reg. C. Moxley, 90, Cromwe Durban, South Africa. (Durban Camera Club).

Gerald Sydney Newbery, 1: ington Way, Norbury, S.1

Milos Novak, Film Unit, slovak Forces in Great Brit

Pavel Podolier (1st Lieut Russell Court, Woburn Pla

Stanley Arnold Powell, 16 stone Road, Carlisle.

Frank E. Read, 161, Stok Westbury-on-Trym, Bri (Member, Bristol Camera

John Read, Chatsworth Ho lington Hill, Uxbridge. (Uxbridge and District Club).

David Daniel Rees, 14, Pei Road, Gorseinon, nr. Swa

Ludwig Schenkel, 8, Balm nue, Londonderry. (Mem of Derry Camera Club).

Ian Norman Schiller, 15, R Road, New Barnet, Herts

ber, Barnet and Finchley graphic Society).

Tom Brian Smith, 77, Grea Petts Wood, Kent.

James Arthur Smith, 752, Road, Failsforth, Manc

John Henry Smith, "Eastre forth, Leeds. (Member Photographic Society).

William John Street, 142, B Didcot, Berkshire. (Didcot Camera Club and ter Postal Photographic

George Emlyn Thomas, 161 Lime Street, Gorseinon, (Member, Mumbles Came

Francis Henry Viner, 55, H Road, Castle Bromwich, V shire.

William C. Ward (Pte. 6 Battery "D," 1st C.A., A. c/o Postmaster, New Orle

U.S.A.

36 Glenlyen Road, S.E.9 (Signed) S. HUGHESDON) *Joint H*
(Signed) E. R. WOOD) *Aud*
9, Cambrian Rd., Richmond Surrey)
9th January, 1943.

Sixth Annual Report

(Signed) T. STEWART,
Hon. Auditor.

Film Library

The number of films is slowly but steadily increasing, and the full list of titles is now:

Section A	Fest Gauge
1. "Gaiety of Nations" (Ahern and Sewell) ...	400 16
2. "Sir Christopher Wren" (London A.F.C.) ...	400 16
3. "Refuge" (Planet A.F.S.) ...	950 16
4. "It Never Rains" (Colour) (Stoke-on-Trent A.C.C.) ...	400 16
5. "Mower Madness" (F. M. Marshall) ...	400 16
Section B	
6. "Cornish Pyramids" (H. Walden, A.R.P.S.) ...	200 16
7. "Dartmoor Southwards" (H. Walden, A.R.P.S.) ...	200 16
8. "Animality" (A. J. Bromley) ...	200 16
9. "Foursomes" (A. J. Bromley) ...	400 16
10. "Idle Times" (A. J. Bromley) ...	400 16
11. "The Rabbit" (Wimbledon C.C.) ...	100 16
12. "Swing, Mr. Charlie" (Wimbledon C.C.) ...	330 16
13. "Whaling near Durban" (C. W. Hyde) ...	200 16
14. "Your Humble Servant" (G. Wain, A.R.P.S.) ...	320 9.5
15. "Safer Beckenham" (Beckenham C.S.) ...	400 16
16. "Harvest Moon" (Beckenham C.S.) ...	400 16
17. "You Cannot Build Without Bricks" (Beckenham C.S.) ...	400 16
18. "Competition Incident" (Beckenham C.S.) ...	300 16
19. "Practice at 'A' Depot" (Beckenham C.S.) ...	200 16
20. "Some Air Raid Injuries and their Treatment" (Beckenham C.S.) ...	400 16

(All Silent Films).

No. 20, the latest addition, is part colour and part monochrome, and the injuries are vividly realistic. We much appreciate the generous spirit of the Beckenham Hon. Secretary, Mr. John Mantle, who sent us the last six films before joining the Forces.

Panels of Lecturers and Judges

We desire to express our best thanks for the continued support of the above Panels. On account of travelling difficulties it will be appreciated that many Lecturers are not now able to travel far outside their own areas.

General

The Officers desire to express their thanks to those members who continue to give film shows to the Fighting and Defence Services; also to those Societies still giving their valuable support to the Federation.

(Signed) T. S. LUTAS,

Chairman.

(Signed) WM. SUGDEN,

Hon. Treasurer.

(Signed) G. WAIN,

Hon. Secretary.

ANNOUNCEMENTS

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2 2s. 0d.; Group subscriptions, which became due for renewal on the same day, are as follows: Scientific and Technical Group, 7s. 6d.; Pictorial Group, 5s.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s.; Kinematograph Section, 5s.

Group subscriptions may be included with the Annual Subscriptions, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscriptions to the Society through their own Bank to The National City Bank of New York, in New York, or direct to The National City Bank of New York. Such subscriptions should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London, account. Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to ask them to mention their names, address and status (Fellow, Associate, Member); and Members making the remittance direct to The National City Bank of New York are requested to give this information.

It is important to note that payment should be made

"For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the same time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

Annual Exhibition Arrangements and Lecture Programme

Friday, September 3rd, 3 p.m. to 6 p.m. Private View.

Saturday, September 4th. Exhibition open to the public.

Saturday, September 11th, 5 p.m. Projection of Monochrome Lantern Slides accepted for the Exhibition.

Tuesday, September 21st, 6 p.m. Meeting to be arranged by the Scientific and Technical Group.

Saturday, September 25th, 5 p.m. Lantern Lecture, "North Africa," by G. B. Mason.

Saturday, October 9th, 5 p.m. Projection of 16 mm. Technicolor Travel Films.

Tuesday, October 19th, 6 p.m. Meeting to be arranged by the Scientific and Technical Group.

Saturday, October 23rd. Closing day of the Exhibition.

The Exhibition will be open on weekdays from 10 a.m. to 5 p.m., and on Sunday, September 12th, Sunday, September 26th and Sunday, October 10th, from 2 p.m. to 5 p.m.

Saturday, October 30th, 3 p.m. Meeting arranged by the Miniature Camera Group. "Experiences with the 2½-inch square Miniature Camera," by Bertram Hutchings, F.R.P.S.

Saturday, November 6th, 3 p.m. Meeting to be arranged by the Colour Group.

Fellowship and Associateship

Notice is hereby given that applications for the Fellowship and Associateship in all Sections will be considered by the Advisory Committees appointed by the Council. Associates desiring to take up the Fellowship, and Members desiring to take up the Associateship in any Section, should address their applications to the Secretary not later than April 1st, on forms to be obtained from him at 16, Prince's Gate, S.W.7. The Advisory Committees in all Sections meet half-yearly, in April and October.

R.P.S. MEMBERSHIP

In order to stimulate a more direct interest in the activities of the R.P.S. among members of affiliated societies, and at the same time to afford officials an incentive to benefit the financial position of their own societies, the Council of The Royal Photographic Society offers a special rebate of 25 per cent of the first year's subscription of each member of an affiliated society who joins the R.P.S.

The primary object of membership is to assist the Council in furthering the advancement of photography, but there are many privileges incidental to membership, including the receipt of a copy of this *Journal* immediately upon publication each month.

The Associateship and Fellowship will naturally interest those who have progressed in the art or science of photography. These are coveted distinctions, and are accepted universally as evidence of genuine photographic ability. The entrance fee of one guinea is already waived to members of affiliated societies, and the amount of the rebate to the societies to which the new members belong will therefore be 10s. 6d. in each instance.

Secretaries of affiliated societies are invited to give their careful attention to this scheme and to co-operate in making it successful. The Secretary of The Royal Photographic Society will be glad to give them further particulars and to furnish copies of the Society's prospectus or to communicate direct with prospective members if they will furnish their names and addresses.

THE PHOTOGRAPHIC JOURNAL

THE OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND
THE PHOTOGRAPHIC ALLIANCE

HONORARY ADVISORY EDITORS.—*Scientific and Technical Section* : C. WALLER, M.Sc., A.I.C., F.R.P.S.
Pictorial Section : J. DUDLEY JOHNSTON, Hon. F.R.P.S. EDITOR : H. H. BLACKLOCK, F.R.P.S.

VOLUME
XXIII

SEPTEMBER, 1943

TWO SHILLINGS
AND SIXPENCE



BETROTHED

J. C. A. REDHEAD, F.R.P.S.

From the R.P.S. Annual Exhibition

THE INTEREST OF WAYSIDE ARCHITECTURE

By Bernard Moore

A Joint Meeting of The Royal Photographic Society and the Birmingham Photographic Society was held at the Headquarters of the latter, York House, Great Charles Street, Birmingham, on October 13th, 1942. The Chair was taken by the President of the Birmingham Photographic Society, Mr. G. B. Mason, who expressed great pleasure in introducing Mr. Bernard Moore, one of the oldest members, to give his lecture bearing the above title.

IN his introduction to his book on Tudor Cornwall, Mr. A. L. Rouse says: "There is no research more fascinating than the attempt to decipher an earlier vanished age, beneath the forms of the present, and the successive layers that time has imposed. So it is that beneath the towns and villages, the roads and fields of to-day, we may construct under our very eyes, out of the evidences that remain, a picture of a former age."

The land has not much changed, the area of cultivation has been extended and waste land reclaimed, but of the works of man more has changed, though even here our older buildings retain much of their characteristic appearance.

To the photographer the architecture and history of our ancient buildings will always be of interest, in the main confined to our Cathedrals and Abbeys, probably on account of their greater pictorial possibilities, but often these do not reflect the development of their period, and the influence of local conditions so clearly as do the less important erections.

Probably our oldest example is the Temple at Avebury, on the Wiltshire tableland, at the meeting place of the ancient trackways of Britain. Said to be the largest of its kind in the world, consisting of an earthen bank enclosing a circle of twenty-nine acres, in which are rings of rough stones. Although of such great age, there is no record of it before 1643, when Aubrey, one of the earliest archaeologists, showed it to Charles II, and by his command wrote an account of it.

A period of some thousand years lay between Avebury and the well-known Stonehenge, and there is a marked advance in its construction. The stones are tooled and squared, and recessed to the lintels. An inner circle of small blue stones is foreign to the locality, and is thought to have been brought from the Presely mountains in Pembrokeshire, the first example of a use other than of local material, which later became more common in our greater buildings. The transport of these stones would be a remarkable feat; boats, probably only of wooden frames stretched over with skins, must have taken them over the Bristol Channel, and up the Avon. It is very improbable

that the Druids had any connection with Stonehenge. The first recorded mention is believed to have been by the Greek, in 400 B.C.

Some of the earliest erections of primeval man are long barrows, of which there are many examples probably between two and three thousand years before the birth of Christ, by men of the Stone Age, contemporary with the peoples of Avebury. The numerous round barrows scattered over the country are of date, and consist of unworked stones placed together to form a rough chamber, and covered with a large mass of earth. They were chiefly burial places, but are incorrectly described in guide books as altars. Being usually in exposed sites, the action of the weather has washed away the covering earth.

Traces of a type of dwelling that must have come from the Stone Age to comparatively recent times are the "Hut Circles" recorded on the map in many parts of the country, very difficult to photograph, consisting of a low circular wall of stones, never more than four feet high, and often hidden in the long grass. They had probably a roof of wooden poles meeting in the centre, with a hole for a chimney and covered with rushes, heath, or skins. They were inhabited by a pastoral people who tended their cattle and were clothed mainly in skins.



Left: Avebury Temple. Stone in south ring. Right: Sampford Church. Saxon design, almost Rhenish design of Churches of Norman monastic communities to which Edward the Confessor brought the land in about A.D. 1000

land the first known building, as we use the word, is that of the Romans, and there are many throughout the country, for the most part on foundations, and the tessellated pavements so freely preserved to us by the accumulated centuries. The architectural quality of the Roman in this country was in no way comparable with Rome, being for the most part the work of foreign hands under Roman direction. The successive waves of barbarism that swept over Britain after the fall of the Roman Empire destroyed nearly all traces of its civilisation, and the struggle for Saxon supremacy obliterated its memory, and there is little record as to how the new-comers replaced them.

Chiefly on the shores of the Baltic, they were Germans, and used wood only in the construction of dwellings.

Called "Saxon" style stone buildings, built at the beginning of the Saxon period, probably by Norman workmen brought over by the influx of Norman monks, the Romanesque tradition in France, and were called "Saxon" than were the villas of the Roman period "British."

The stone crosses of Keltic design in Cornwall may be of the Saxon period, or even earlier. Evidence of Christianity in part of Britain before the coming of St. Augustine. The Britons, like all savage peoples, had a great objection to assembling in buildings. The early history of the Keltic church, writing in 750, says: "They would not have a church, but a standard wooden cross, lifted upon high, so as to be convenient for the frequency of daily prayer."

The element of the Normans was not marked by any change in the manner of building. There are few remains that can be safely placed at an earlier date than the Norman building was in the most massive form, in places the weight on each pillar is roughly 200 tons; they failed, however, to provide foundations sustaining such great weights, and the collapse of many examples has been only prevented by the construction of new foundations. The intercourse between the countries during the Crusades had a marked effect on the decoration of the later Norman period, the style became familiar with the more ornate carving introduced from the east.

The change which replaced what we now term Norman architecture was very gradual. It is a mistake to suppose that so-called architectural styles can be narrowed down to fixed dates. The development of English Gothic architecture compared to the alteration in the fashion of the wardrobe, hardly noticeable day by day, but showing a gradual evolution over a long period. Very few of our old buildings are completely of one style, any alteration or improvement being done in the then existing fashion, with the result that, in daily use.

Houses are among the most interesting buildings of the past. In the Roman occupation, the "villa" had its columbarium, but the earliest existing house is supposed to be of the circular type, which may have been introduced by the Normans. In the middle ages the house was limited to lords of the manor, knights, and some of the parochial clergy, but it came to be used by a tenant to maintain a cote, and to obtain a licence from the lord of the manor.

It was not looked on with favour by the king because of the grievances of the peasant rebellion led by Kett, in 1549, was "We pray that no knight or esquire keep a dove-cote, but that the degree of a knight or esquire keep a dove-cote it hath been ancient custom." Some of the old dove-cotes contained 600 nesting-places, and a revolving ladder, called a "potence," on which a receptacle for the "salt cat," In old books



Keltic Cross, Nevern, Pembrokeshire



Norman Work at Boxgrove

are many directions for making salt cat, which seems to have been used as a form of disinfectant. The body of a cat, filled with saltpetre and other ingredients, was a popular recipe.

Many of the oldest smaller domestic buildings which are still standing, were erected in the fourteenth century. Their construction was not so much influenced by architectural fashion as by their geographical position. In the timber region from Lancashire, through the Midlands to the mouth of the Severn, are to be found the best examples of timber-framed houses, noted for their elaborate design and the size of their beams. Another timber belt ran from Lincolnshire to Kent and the New Forest, but in this area the depleting of the oak forest by the iron smelter, and nearer the coast the demands of the ship-builder, who used chiefly oak, led to the use of lighter timber and wider spacing. The great belt of limestone from Lincolnshire to Oxford and Dorset contains the best of the stone houses, the ease with which the limestone is carved giving more scope for decoration. In all the northern counties, and in Cornwall, is found hard sandstone, and granite, and here the houses are simple in design, and the stone is in large pieces, with little carving, to reduce the labour in cutting. Flint, chalk, sand and clay, prevailing in the eastern counties, provide the brick, plaster and flint work for which this part of England is famous.

In the construction of the earlier timber-frame houses, the roof is not placed on the walls, but is supported on pairs of great timbers leaning against each other at the top, with a cross piece as the letter A, prolonged to the

width of the base. Two of these "crucks" are placed at the ends of the proposed building and connected at the top by a roof-tree, or ridge pole, beams were set on the ends of the cross pieces, and framing from these to the ground formed the walls. The spaces between the timbers was originally filled with wattle and daub, in many cases being replaced later by brick. Houses were enlarged by setting up more than one pair of "crucks" in a line, and it is interesting that in almost all instances the distance between each pair is the same—about 16½ feet, or one rod. The origin of this measure is obscure, but it is about the average width of a yoke of oxen, ploughing abreast. In the original homes of the Saxons the oxen were stalled under the same roof as the household, and it may be that the distance was arranged to allow their being stabled without unyoking. The distance between roof supports came to be called a "bay," even up to the reign of James I, and in the sixteenth and seventeenth centuries houses were let or sold by the bay. In "Measure for Measure," Pompey, the servant, says: "If the law hold good in Vienna, ten years, I'll rent the fairest house it in after three pence a bay." Building on crucks was discontinued by reason of the obstruction of internal space, and the lessening supply of timber. In the larger houses, even before the Reformation, the roof was laid on the walls and supported by them. The overhanging upper stories, common in timber-frame houses, are often said to be to gain space, in confined areas such as walled towns, but it is found in isolated country buildings where space is no object. It is more likely that it was to protect the lower walls from the water from the roof, which was not provided with a gutter. The problem of keeping out the damp due to the shrinkage of the woodwork was as much in the mind of the fourteenth century householder as it is to-day, it being difficult to make the joint between the framing and the daub or brick filling watertight, both in summer and winter. Many houses were plastered over a few years after being built. The rich man used oak panelling, tapestry or painted cloth to keep out the damp and draught, and the poor man plastered the inside with lime plaster. Shakespeare must have had this in his mind when he wrote "Imperious Caesar, dead and turn'd to clay, might stop a hole to keep the wind away; O that that earth, which kept the world in awe, Should patch a wall to expel the winter's flaw." In the mediæval period, the home of the substantial yeoman farmer followed the same plan as the greater houses. A hall, the full height of the building, open to the roof timbers, had at one end a chamber half its height, with another over it. At the other end was a passage entrance, with a buttery and pantry opening from it, with a room above, reached by a wooden stair. A paved space in the centre of the hall formed the fireplace, the smoke escaping through a louvre in the roof, and by unglazed windows on two opposite walls. Thatch was in general use as a roofing, but the corn was reaped halfway up the straw, the stubble left was pulled up and used with the root-end outward, the lower stalk being much more durable. In many districts houses were constructed with mud walls, known in Devon as "cob." It is not easily distinguished from rubble. It was used in London as far back as 1222, and was made in the manner of our modern concrete, mud being pressed between wooden moulds in layers of about two feet six inches high, giving each layer some time to harden. A two-storied house, if properly built, would take two years to construct.

Houses so constructed were quite durable, if protected from the action of the weather by a good roof and foundations. A saying in the west country was "All cob wants is a good hat and a good pair of boots." From the first Crusade the Normans were familiar with the decoration in colour that was an ordinary feature in the eastern

buildings. Most of our English cathedrals were originally highly coloured, and traces still remain. The Tower, at the Tower, derives its name from its whitewashed, but in this case it was not for decorative purposes, but to render it conspicuous as a sea mark to the port of London, the Thames being in earlier times a wide estuary.

The flint and brick chequer in Norfolk and the other counties, although it may have originated from scarcity of stone, demonstrates that diversity of material was considered a legitimate means of architectural decoration. In the early records of our English architecture there is no mention of brick, but it is supposed to have been included in the term "tile" to which there are many references. There is no doubt that bricks were used in the eastern counties long before they were used elsewhere in England. It is a region of clay, with a lack of stone and timber. Another factor was the proximity of the Fens, the home of the best brick building, and the ease of importation of bricks was easy. Painted in the Flemish pattern, were used throughout the eastern counties, together with the stepped gable.

The years of peace, after the Wars of the Roses, the decay of the Feudal System, and the rise of a class of rich merchants in the reign of Edward IV and Richard III, resulted in the erection of a number of beautiful houses in the "Perpendicular" style. The great prosperity of the wool trade in the Cotswolds at this period, with the abundance of easily-worked stone, provided an area with some of the best examples.



Acton Burnell. One of the first stone houses other than Royal Castle. Built about A.D. 1284



Old Timber-frame Houses, Alcester



House of slate and granite, Padstow

its later stages, Gothic decoration rather degenerated into excess and confusion. The buildings of the rich hants often exhibited that tendency to ostentation associated with the newly-rich.

At the dawn of the Renaissance, in the reign of the Tudors, in the end destroyed English native architecture. The Gothic builder began operations with little else than a general plan. There were few drawings, and even these, compared with the work they are supposed to foreshadow, show great divergency and incompleteness, and it seems no doubt that the designers of the general plan were the master mason and the master carpenter, in his own branch, as there are instances of a lack of coordination between these two. There are preserved in the state papers of Henry VIII many directions for the reconstruction of Crown property. As an example, they run roughly as follows: "Make an arch, with drip stones on it. Let two heads be carved one on each side." This instruction was passed on to the mason, who did the work according to his own idea.

The country abounds in Tudor houses. In all cases beautiful, but perhaps the most charming is Compton House, near Banbury. Built about 1510, the design is that confidence in the peacefulness of the time was complete. It was originally surrounded by a moat, the door and the outside windows are small. The decorated chimneys were carved into their shape from solid brick. The great hall is in the medieval tradition a dais and a minstrels' gallery, and is lighted by a window to the inner court.

At the reign of Henry VIII the first signs of that rupture from the native style which eventually destroyed English architecture, originated with the tentative use of Italian and German workmen brought into the country by the King and Cardinal Wolsey. The fall of Constantinople flooded western Europe with Greek arts and literature, and with the invention of printing brought about the great movement known as the Renaissance, or "new birth." The new outlook finally reached England, but as it moved across the country it became tinged with the peculiarities of the various countries through which it passed. The change in religious thought was not favourable to church build-

ing, but the new nobility, rich with the spoils of the dissolved monasteries, and the wealth of commerce, had acquired a taste for grandeur that required a great mansion for its display.

The English house had developed on very different lines from the Italian, and up to the time of Charles I national individuality was sufficient to raise the result to a distinct style, but the invention of printing brought to the native craftsman not only the plans and pictures of buildings in foreign lands, but rules founded on classic history, which Italian architects laid down for the proportions of buildings generally. Fitting these rules to the circumstances and needs for which they were never intended was a problem that was too much for our designers. Christopher Wren and Inigo Jones were, by their genius, able to bend these rules to their will, but in the end the rules triumphed, and by the eighteenth century Italian building was copied almost line for line, so that the Renaissance in England was not a new birth in the spirit of architecture, but only the acquiring of knowledge to satisfy the demand of a patron for a particular style.

As the demand for more exact copies of foreign models increased, a designer was needed who had visited the original building, or had by reading obtained knowledge of Classical architecture, a condition beyond the reach of the craftsman, and so the architect, as we use the term to-day, was introduced. In the first of the English Renaissance it is certain that the details of design were left to the workman. In the Cecil papers are many directions to the foreman relating to the building of Burghley House. Among them is a plan of a window with "Henry's platt of my window," in Cecil's own writing. Henry



Somerset Cottages, built in rubble and "cob"



Muchelney. Fourteenth-century Vicarage House



Windmill, Chesterton, Warwickshire. Designed by Inigo Jones, as a prospect tower



Entrance, Blickling Hall, Norfolk. Early Renaissance in its best form

was a Dutch mason employed by Thomas Gresham in building the Royal Exchange. The period of the Renaissance brought about a change of plan of the English home. The hall became no longer a living room, only a vestibule, entered at the side, not at the end as of old, and there was no dais, the family and retainers having their meals in separate rooms. This change, that took more than a century to bring about, was more the alteration of our English habits, but the Italian influence on the plan co-operated to lead the design further from the old tradition. The open arcade, which was a feature of this period, may have been due to desire to introduce the Italian "loggia," but it has its counterpart in the Gothic cloister. Later generations found these arcades unsuitable to the English climate, and most of them were later filled up. The reign of Queen Anne and the early Georges saw an advance in the comfort and convenience of the home, and sound architectural merit. The period of the Regency saw a large extension of London and many provincial towns. Houses were built in rows and crescents, grouped together for convenience and effect. The chief material was stone, or brick covered over with stucco, the more efficient means of transport making the use of local

material less important. Curved bay windows, embellishments, and the prolific use of the balcony, were the features.

The nineteenth century marked a great decline in domestic architecture. A great building age had passed, but the nation had lost its interest in architecture. Architects were still doing good work, but most of their clients were uneducated in artistic appreciation, and the architects were engaged in fighting over the respective merits of the Classic, and the attempt to revive the Gothic, with the spirit of the older time.

To-day, the knowledge and appreciation of the beautiful in architecture has greatly increased, due in a measure to universal expansion of photography as a hobby. Modern design has exhibited a marked improvement, and with further experience of the new materials and material much will be done, but it behoves us to preserve and cherish the lovely and interesting buildings of a past age.

The lecture was fully illustrated with slides of the technical standard associated with Mr. Moore, and close Mr. Stanley G. Hall proposed a hearty vote of thanks be accorded him. This was carried with app



Potter Heigham, Norfolk, Flint Church

PHOTOGRAPHY IN THE DRAWING OFFICE

By F. J. Tritton, B.Sc., F.I.C., F.R.P.S.

At a meeting of The Royal Photographic Society, held at 16, Prince's Gate, S.W.7, on May 1943, Mr. F. J. Tritton, B.Sc., F.I.C., F.R.P.S., read the following paper.

A large audience was present at the meeting.

The President, Mr. D. McMaster, F.R.P.S., was in the chair.

subject is specially topical in these war years, and the greatly accelerated rate of both design and production has placed considerably increased demands on the drawing office, and in some cases brought it into more direct contact than before with the production department. Combined with this has been the necessity of ensuring the safety of the accumulated stock of drawings, which represents one of the chief assets of engineering firms, and the co-ordination of munitions production has meant the despatch of large numbers of drawings to the Dominions and our Allies. In these circumstances photography has been found to be of immense value, and it is proposed to explain some of the methods which have been used, and the reasons for their adoption. It is thought that a short historical review will be out of place.

It should be made clear that the author is not an engineering draftsman, so that technical errors arising from this must be excused. Also no attempt will be made to illustrate the apparatus suitable for use with the processes under discussion; there are others more competent to consider this aspect, and, in any case, it is to be hoped that after the war much new and improved equipment will be introduced. There is still scope for improvement.

of Processes

In 1839 saw the first development of practical photographic processes in the form of the Daguerreotype, paper negatives and positives of the Calotype. In 1842 Sir J. F. W. Herschel (1) investigated the sensitivity of iron salts and used one of the salts he developed to copy his notes. Another of his salts was the basis of the Ferro-Prussiate Process, which did not come into commercial application until 1860 when the paper was sold by Marion, in Paris, but it was not until blue print papers were not manufactured in this country until about 1893. This delay in the development of the process was apparently because the photographic pundits of those days were not greatly impressed with the blue image as a means of recording photographic detail, and so attention was given mainly to other processes, consisting of a precipitated silver on a colloid layer, of which the albumen papers were the best known, and were found to be quite suitable for the reproduction of technical drawings, being used extensively from 1873 onwards.

In the prussiate papers it is the iron salts which are used, but the image so produced is practically the reverse of the advantage of the process being that the image can be incorporated in the paper and on exposure will react with the ferrous salt formed on exposure to produce a prussian blue image. There will not be time to consider the numerous other methods of producing the iron image which have been devised, but they do deserve particular attention.

1. Poitevin (2) published details for obtaining

prints in writing ink, i.e., ferro-gallic ink, the iron treated paper being dipped after exposure in a solution of gallic acid. But the results were not of much value, as the image sank into the paper and often only gave a brownish colour. Later workers, for example, Lietze (3), in 1888, added gelatine or gum arabic to the coating solution which kept the image on the surface, but the ferro-gallic process did not reach commercial importance until methods of incorporating the gallic acid with the paper had been developed, so that only washing in water was required. As early as 1884 Shawcross (4) took out a patent for dusting powdered gallic acid over the paper with brushes after sensitising in the iron solution, while a later method (5) is to apply the gallic acid in alcohol solution in the presence of sufficient acid to prevent a reaction until the acid is diluted with water. The disadvantages of the ferro-gallic process are a relatively longer exposure time and the necessity for greater accuracy in exposure and processing than is necessary with ferro-prussiate papers, but the image is a positive and has good colour intensity, while it is easy to remove unwanted lines, such as those produced by creases in the original; the sensitive paper also has excellent keeping qualities, provided it is kept dry. That these advantages are insufficient is proved by a steady decline in popularity, of course, hastened by the equally steady rise of the diazo papers, which are simpler to handle because they do not require wetting and subsequent drying.

Pellet's Process (6) or Cyanotype yields blue lines on a white ground, and is really a development of one of Herschel's original suggestions. Despite considerable improvements introduced by Pizzighelli and others, and the fact that a relatively short exposure is required, it is now defunct, owing to the number of steps involved in processing. The paper was sensitised with gum arabic and a ferric salt, and after exposure developed with potassium ferrocyanide solution, followed by an acid bath and a water wash.

The so-called sepia paper has also died out in recent years, despite its simplicity and quick printing; this is a combined iron and silver process yielding a negative image consisting of clear lines on a brown ground, from which blue prints consisting of blue lines on a white ground or further brown line prints can readily be prepared; the direct positive processes have, however, proved more popular, probably because modern drawing offices do not trouble to eliminate defects and marks present in the original when making their duplicates, one of the chief advantages of working via a negative image being that defects can readily be blocked out. The use of the light sensitive iron coating, after exposure, to reduce a platinum salt and deposit metallic platinum in the position of the image is the basis of the Platinotype process, patented by Willis in 1873 (7), but it was not until 1889 that W. W. J. Nicol (8) perfected a similar process of earlier origin, using silver salts to produce continuous tone photographs (Kallotype prints). H.

Shawcross (9) also patented the same technique in the same year, this developing into the sepia process for plan copying, the exposed image requiring fixation in hypo, washing and drying.

Since all the processes for toning images to various colours and using chromium, uranium and other metals can be ignored, the next important development is what has come to be known as the True-to-Scale process. It was Poitevin (3) who first noticed that ferric salts make gelatine insoluble, but that on exposure to light to form ferrous salts, the solubility is restored. On this he based a process for inking up the hardened image with printer's ink, and transferring the ink image to another paper surface. This particular method has not proved popular. A. Tellkamp (10), in 1905, devised a convenient method of taking ink impressions which has proved commercially important; when a gelatine-glycerine pad containing a ferrous salt has rubbed down on to it an exposed sheet of ferro-prussiate paper, the excess of ferricyanide in the unexposed lines combines with the ferrous salt in the gelatine to form prussian blue, which has a tanning effect and will cause the lines to accept ink. It is only necessary to leave the blueprint image in contact with the jelly for about a minute, strip off and immediately roll up with ink, roll down a sheet of clean paper, and peel off, when a perfect ink reproduction can be secured. From 20 to 50 impressions can be obtained from the one application of the blueprint image, and as the paper does not have to be wetted the image can be claimed to be true-to-scale, ignoring, of course, the natural change in dimensions of paper with changing atmospheric humidity. This process has found wide application under a number of names, such as Fotoldruck, Ordoverax, Velograph, etc., and is probably the best method of reproducing a drawing, but it is essential to start with a perfect original, i.e., a good ink tracing, as otherwise the background will tend to take ink as well as the lines.

The next outstanding development is the introduction of the Diazo processes, the earliest publication being a patent of 1889 by A. Feer (11), which describes a copying paper producing a positive image from a negative. Of the other early suggestions for diazo processes (12), some produced a negative and others a positive image from a positive original. The first successful diazo paper was based on the Kalle patents (13), and was imported into this country during 1924, and manufactured here in 1926. These first or "Ozalid" papers contain a diazo substance which is decomposed by light and an azo-dyestuff component which will not couple with the diazo compound so long as the paper is kept acid, but by rendering alkaline after the exposure the coupling immediately takes place, producing a coloured dyestuff in the form of a positive reproduction of the original. Ammonia gas is the simplest alkali to use, and so the images are developed by placing the paper in a loose roll in a box filled with moist ammonia fumes. Such a process is very simple to operate, and has the added advantage that as the paper base is not wetted there is only a negligible change in size during processing, and, still more important, no drying plant is required.

It would take us too deeply into the subject if we were to consider the finer points on which later patents and processes are based, such as the addition of reducing agents to help keep the background clean. For detailed information reference should be made to surveys by Spencer and by Murray (14). It is obvious that provided the light sensitive component is coated on the paper, the other or coupling component can be applied after exposure, for instance, by sponging over the surface with an appropriate solution. Several methods involving liquid development of this type have been introduced, and papers are available giving lines of many different

colours, although naturally the darker lines are preferable provided the background is free from tint. To avoid having to apply the liquid by hand, rotary developing machines, which apply an even film of liquid by means of a roller, are generally used, this idea being first introduced by Van der Grinten in 1927.

As indicated above, many of the early diazo papers gave a somewhat weak line on a ground which was seldom white, and in some cases the background tended to discolour on storage. Considerable improvements have now been made, black and nearly black lines of good contrast being common. These improvements have had their effect on the manufacturers of ferro-prussiate papers, who have developed special contrasty types for duplicating pencil drawings, some of these being self-toning to produce a more strongly coloured image. While working well with new pencil drawings, they are not too successful when the drawing is badly crumpled, as the creases print and are consequently made more obvious.

In the "Ferazo" Semi-dry Blue Print paper (15), which was out of its experimental stage by 1939, these improvements have been carried still further, the image being developed by spreading a thin layer of a solution of various metallic salts over the paper by means of a roller developing machine of the same type as used for diazo papers, but applying two solutions consecutively. The speed of development is 15 to 30 feet a minute, and as the paper is only damped and not wetted, drying plant is unnecessary. The developing solutions also contain oxidising agents which intensify the blue background, giving a strong image.

Having considered briefly the dates of introduction of the more important of the purely plan copying processes, we can appreciate better the development of drawing office technique, but it is necessary to consider the parallel development of methods of exposing the papers. In the early days of copying exposures were to sunlight or daylight, using large flat or slightly curved printing frames of various designs. Arc lighting was invented comparatively early, but it was not until 1896-7 that the first types of photo-printing machines were introduced, the arc lamp being inside a glass cylinder so that it is brought very much closer to the sensitive surface than is possible with a flat printing frame. The present day type of continuous printer using a fixed cylindrical glass surface and travelling canvas band depends for success on the fact that the friction between the canvas and paper is greater than that between the paper and glass. Such machines were not introduced until about 1902.

There is, of course, a close connection between the rise in the demand for rapid and cheap duplication of drawings and the date of development of photo-printing machines, but conversely the absence of rapid methods of printing no doubt explains the relatively long period between the first invention of the earlier plan copying methods and their wide adoption.

While engineers have been using these various types of slow contact papers, they have naturally been aware of the existence of the silver processes and have used them when occasion demanded. But the early silver bromide development papers were not particularly contrasty, and consequently offered little advantage to compensate for needing a negative image coupled with a complicated processing technique of development, fixation and washing. One technique which has proved useful is that first introduced into this country in 1912 by the Commercial Camera Co. of America, and later taken over by the Photostat Company, in which a negative image is made on paper through a prism and camera, so that the negative is the correct way round to be read. The fact that the image consists of white lines on a black ground is no real disadvantage for line subjects, and being made

in a camera, the image can be reduced to any extent, the limitation being the maximum size which the special cameras are made, viz., 24 x 18.

Of course, there is no necessity to restrict oneself to special cameras, but in practice there are only a few who have adapted larger cameras to this class of thing. Paper negatives of reduced size made on the "Document Papers" adapted for this class of thing are ideal for reproducing many classes of documents, including engineering drawings, when the copy is required purely as a record, but as a step towards producing duplicates of the original for use, for instance, in courts, then this process should only be used with great precautions, and, in all probability, it has not yet reached a stage to impress engineers with the advantage and to be obtained by the use of the silver processes. Indicated later, much improved quality is obtained by the use of special sensitive materials.)

In this résumé we see that in the early days of photography, engineers preferred the silver salts, but have taken great interest in photographic methods of reproduction. As materials became available of sufficient quality to make reduced negatives and enlarged prints, the process was found to be too low and engineers had begun to turn to time to develop the various contact processes on iron salts, and so, with the evolution of special printing machines, built up an industry quite distinct from the other photographic industry based on the use of silver salts. For a long period the liaison between these industries has not been very close, but the high contrast photographic emulsions which have now been available for a considerable time, and the growing demands to expedite the work of the engineering office, we are beginning to see the specialist photographer with his darkroom processes as an important accessory to the well organised drawing office.

One of the incentives to use the silver photographic process came from the tremendous accumulation of drawings which had an historical as well as a potential value and in many cases represented almost the whole goodwill of the company. Drawings are difficult to store successfully, except in big chests of shallow drawers, which must be indexed. Constantly pulling them out and trying to stuff them back again, and the passage through the photo-printing machine, the rapid deterioration of the more valuable originals, which must therefore be retraced at frequent intervals, thus putting a further strain on the tracers and draughtsmen. By making a photographic negative of the original or tracing on non-inflammable film of considerably smaller size than the original, a permanent record is made which is easy to file, can be kept in a safe place from the originals, and from which an enlargement can be made whenever required. Such a process was introduced as a complete commercial system by Messrs. J. and Crowther (16), and has now been widely adopted; a variety of other makes of apparatus is also employed, but the bulk of the work is standardised on the plate film (6½ ins. x 4½ ins.). It is of some importance to note that the film employed is non-inflammable, has not always been the case. Naturally the introduction of this technique was very greatly accelerated by the possibility and probability of air-raid damage caused by the war situation, and also by the fact that the wider dissemination of the armaments industry by the Government has sent whole batches of drawings to various parts of the Dominions and elsewhere, most being carried by air in the form of half-plate negatives for reproduction by enlargement on the other side.

Another technique recently applied to plan copying is the use of the diazo process. In inception this is an old procedure, and has been described many times (17), but its present

success depends entirely on the greatly improved sensitive papers marketed in the few years preceding this war. Modern reflex papers, such as Ilford Document Paper No. 50, consist of a thin uniform paper coated with a slow, contrasty, green-sensitised emulsion, which is placed in contact with the drawing in a vacuum frame and exposed through the back of the sensitive paper; thus the light has to pass through the sensitive emulsion and be reflected back by the drawing to produce the image. Despite this double passage of the light through the emulsion, negatives can be obtained of good contrast and only faintly veiled. So far continuous or rotary printing methods have not been applied to reflex copying, primarily because really first class contact is essential. Since these papers are usually used in conjunction with a yellow filter (although this is no longer essential with the Ilford paper), the reflex copying of blue prints is also possible.

Actually, during reflex copying there must be some loss of sharpness of the line so it is found that when the original is on a moderately thin paper and is clean on the back, a better result is obtained by contact printing through the original on to the same reflex paper. Other bases than paper are in use as supports for a reflex emulsion, but in general these are too expensive to interest the drawing office.

A reason, not so far mentioned, why the silver photographic papers were not popular at an earlier date with engineers is cost. Unfortunately, many engineers appear to have got in to the habit of considering that all those light sensitive papers which are appreciably more expensive than a ferro-prussiate paper are not worth consideration, irrespective of their usefulness. Fortunately that phase is passing with the realisation that there are some classes of copying which are so much better done by the silver processes that the additional cost is justified. Particularly is this the case when a reduced image is desirable or usable, as then the area of paper required is less and the cost correspondingly lower.

Ferro-prussiate and dyeline papers are coated by the impregnation of a relatively absorbent paper followed by a rapid drying operation. Average prices are 1d. per square foot, or even slightly less, while the cheapest of the silver papers—the so-called Document Papers—are approximately 2½d. per square foot to-day, and some of the other papers more expensive. These prices arise from the much higher quality materials and much more elaborate precautions in manufacture which are essential if good keeping quality and freedom from spots and other defects are to be ensured.

Examples of Different Plan Copying Techniques

Let us next consider and examine specimens of a number of different methods of copying a drawing. In so far as silver emulsions are concerned, only the products of Ilford Limited will be referred to, but this does not mean that other equally usable products are not available. It is not proposed to deal at any length with the various bases on which the light-sensitive coating can be prepared. Thus dyeline coatings are available on many grades and thicknesses of paper, tracing paper and tracing cloth, and also on regenerated cellulose and cellulose acetate. The choice of which is the most suitable is one of convenience, combined with cost considerations, and often has little to do with the exact procedure. Similarly, dyeline materials are available which yield images of a variety of colours, the choice usually being dictated by considerations other than purely technical.

When a same size reproduction of a drawing is required, one of the various processes based on iron salts or a diazo paper is the natural choice, and the use of the silver salt processes would not be necessary, provided all originals

had good strong lines on a clean background. But when reproducing an original having poor contrasts, that is, one consisting of weak lines on an off-white background, or one which is crumpled or dirty, the greatly increased contrast that can be obtained by the suitable use of silver bromide emulsions can very greatly improve the result. These advantages become most obvious when reproducing copy which is already a reproduction of the original.

For the purpose of illustrating this talk, two 14 x 11-inch originals have been used so as to avoid having the usual large sheets of paper to deal with, but where methods of reduction or enlargement are under consideration, these small originals have been treated as the

corner only of a larger drawing, so that the conclusions arrived at are applicable to commercial conditions. Two originals are:—

- A. A pencil drawing on detail paper with a plain border around the edge of the paper.
- B. An ink tracing from A on the usual bluish linen.

Both these originals are of ordinary commercial and contain alterations and other defects. They have been reproduced by all the methods. Table I lists simple and convenient methods of producing a duplicate of the drawing, each method having its own advantages and drawbacks. An estimate is given, for each original, of the quality of reproduction which may be anticipated.

TABLE I
REPRODUCTIONS FROM THE ORIGINAL

<i>Method</i>	<i>Result from Original A (Pencil Drawing)</i>	<i>Result from Original B (Ink Tracing)</i>	<i>Remarks</i>
1. Ferro-Prussiate Print	Moderate (background mottled and weak)	Good	Bichromate treatment special self-toning paper darker blues and better contrast but may cause film to veil
2. Ferro-Gallic Print	Poor (weak and background prints through)	Moderate	The contrast of this process not very high
3. Sepia Print	Poor (contrast and low background prints through)	Moderate (lines relatively weak)	A sepia negative is made. The contrast of this process poor
4. Dyeline Print (nearly black line)	Moderate (lines rather weak and background prints through)	Good	Similar results are obtained whether ammonia developed or semi-dry developed acid and alkaline developer types)
5. True-to-Scale Print	Poor (lines broken and background beginning to print)	Perfect (lines stand out better than on the original)	A perfect process provided original is in ink
6. Reflex Print (negative exposed through the Reflex Paper)	Moderate (fine detail slightly clogged)	Good (finest detail slightly clogged)	Contact positive from the negative also on Reflex Paper
7. Print-through Print (negative exposed through the original on to Reflex Paper)	Good	Perfect (even better than 5)	Contact positive from the negative also on Reflex Paper. Only usable when the background of the original is clean
8. Paper Camera Negative (on Document Paper No. 4r)	Moderate (contrast rather low)	Good	Comparable with Photo-copying. If taken through prism the negative is a suitable duplicate. Usually reduced in size.
Original	treated as though it	were a full 30 x 20-inch	drawing
9. Positive obtained by re-photographing 8	Moderate (lines rather weak)	Good (background liable to be uneven if the paper is crinkled)	This is the Photostat technique when more than one duplicate is required. Better than poor originals
10. Positive obtained by printing through 8	Poor (background prints through)	Good	Document Paper No. 5r. Better than 9 for good originals

continued

<i>Method</i>	<i>Result from Original A (Pencil Drawing)</i>	<i>Result from Original B (Ink Tracing)</i>	<i>Remarks</i>
but the negative on Photomechanical	Good (lines are crisper and denser than in 9 or 10)	Nearly perfect	Photomechanical paper has much better contrast, particularly when the positive is printed through the negative. Positive on Document Paper No. 55
late negative on line and contact print on card Original	Moderate (lines inclined to be weak) treated as though it	Good were a full 30 × 20-inch	Contact prints are useful for a card index file. Usable for originals up to 40 × 30 inches. drawing
ement from 12 to 1 size Document Paper No.	Good	Nearly perfect	The enlargements are usually made reversed if they are required for subsequent contact reproduction
Negative, double-size, and enlarged to original size Original	Poor (lines weak and fuzzy) treated as though it	Moderate (lines fuzzy) were a full 30 × 20-inch	Negative on Micro-Neg. Film. Positive on Document Paper No. 55 drawing
but assuming the 1 to be a small one, 1 × 11 inches	Moderate	Good	A usable technique for small drawings

examination of the list of specimens indicates comparatively easy to reproduce the ink tracing, the methods being reasonably satisfactory, and good. But the pencil original on ordinary paper does not reproduce really well by any of the methods we come to the processes using silver salts, Method 7. This would be even more obvious of a drawing which was old and crumpled. The question of size, easily detectable differences between the dyeline and true-to-scale processes on contact, and those papers which have to be water ring processing, and, in particular the silver print it would seem that such variations ought to be considered of relatively small importance under circumstances, because all drawings should be made, and even the best papers must vary slightly with the humidity of the atmosphere varies. The use of silver emulsions enables deliberate change of contrast to be achieved, combined with an increase in contrast. But it will be seen that the early Photostat reduction (Method 8) does not give as much contrast as is desirable, because the document is not suitable for general work are not made to maximum contrast. Method 11 is definitely

13, employing a half-plate film negative, is better still, and has the advantage that the small most convenient for filing and storage. Microfilm (Method 14) is still more economical, both in material and storage space, but is not to be used except for quite small subjects, and then the drawing is in reasonable condition. Too few people who are not photographers can realise that photographic negatives are made up of masses of fine grains of metallic silver, and that a line which is quite well defined will appear granular and if enlarged too much. For plan copying, consisting of fine grains are chosen, but, nevertheless, there is a definite limit to the degree of enlarge-

ment which is desirable. Of course, micro-copying of large plans can be used if one is prepared to photograph a suitable number of overlapping sections or if it is recognised that it will be necessary to make tracings from the enlargements from each negative, should the original plans be lost.

So far consideration has only been given to direct reproduction from the original. But frequently a large number of duplicates of a drawing are required and it would not be economical to use some of the silver emulsion processes referred to above; for example, reflex or contact (print-through) copying (Methods 6 and 7) could not compete with dyeline on price, although the copies should be of better quality. But it is just here that the silver emulsion processes begin to be really useful; they enable an intermediate reproduction to be prepared which is more contrasty than the original, and from this copy good quality reproductions can be run off by the economical ferro-prussiate or dyeline processes. True-to-scale is another of these intermediate processes, but it is only successful if the original is a good one—then it is probably the best and most economical of all reproduction methods. Its use can often be combined with that of other intermediate processes with advantage. A few such methods are indicated in Table II and again the quality of final reproduction to be anticipated is given, using as far as possible the same standards as in Table I.

Iford Orthotrace has been deliberately mentioned in the above because it consists of emulsion on a translucent paper base particularly suitable for this class of work. Unfortunately, it will be unobtainable for the period of the war, although other products of a similar type may be available in small quantities. Its place can be taken by Iford Contact Film, which is both more expensive and less convenient to handle, or by an emulsion on a thin paper base, such as Document Paper No. 55, this being much more economical but not quite so good, as shown by comparison of Methods 17 and 18 or 19 and 20.

TABLE II
METHODS FOR BULK REPRODUCTION DEPENDING ON AN INTERMEDIATE REPRODUCTION

<i>Method</i>	<i>Result from Original A (Pencil Drawing)</i>	<i>Result from Original (Ink Tracing)</i>
16. Reflex negative and positive on Reflex Paper (Method 6). Dyeline Reproduction	Poor (some thickening of lines)	Moderate (some thickening of lines)
17. Print-through negative and positive on Reflex Paper (Method 7). Dyeline Reproduction (or alternatively Blue Print and True-to-Scale Reproduction)	Moderate	Good
18. Print-through negative on Reflex Paper (No. 7). Contact positive on Orthotrace or Contact Film. Dyeline Reproduction	Nearly Perfect (slight thickening of the lines)	Perfect (despite having been p thro' the base of the po
19. Reversed enlargement from half-plate negative film on to Document Paper No. 55 (as Method 13) Blue Print Reproduction	Moderate	Good
20. As 19, but using a reversed enlargement on Orthotrace	Good	Nearly perfect
21. Camera negative on Photomechanical Paper taken through a prism. Positive by contact on to Document Paper No. 55 (Method 11) Dyeline Reproduction	Moderate	Good

(If the positive is not reversed the results are poor)

It will be noticed that even without using Orthotrace or Film, dyelines or blueprints can be obtained which are comparable with those taken direct from the original, and there is no danger of wearing out or destroying the original. The rate of printing from Document Paper No. 55 is relatively slow, but in a normal good quality photo-printing machine it can be passed through at about six feet per minute, which is quite practicable, and is offset by the comparatively low price of the paper. If Orthotrace or Film is used the reproduction from a pencil drawing is so closely comparable with the direct reproduction from a tracing that it is correct to say that under present conditions tracing is unnecessary.

Although these methods in Table II have been described as methods for bulk reproduction, they are also most convenient techniques for renewing the life of old and worn-out drawings.

Many original drawings are used so repeatedly that the lines become weak and the paper dirty and crumpled. Rather than retrace, which involves minute checking, the originals are best reproduced by one of the above methods, by which means quite good duplicates become available.

Finally, we need to consider reproducing reproductions. It is a frequent occurrence for a sub-contractor to receive a single blueprint or dyeline as his working drawing when it is immediately obvious that a number of duplicates are essential. Too often attempts are made to just run off further blueprints or dyelines, because these are the only processes known; then everybody struggles to decipher almost illegible prints. By the choice of a suitable process reasonable reproductions can be made from quite poor prints. A few of the possible methods are given in Table III.

This list of 28 techniques is sufficient to show the wide variety of methods and combinations of methods which can be of practical value, provided the photographer is competent to choose that one which best suits his particular circumstances.

Other Applications of Photography in the Dr Office

In addition to duplicating plans, the drawing is frequently closely associated with other problems which photography may be of assistance. For instance, large numbers of instrument dials or engine identification or instruction panels are required; they will be obtained from a convenient engraver or nameplate manufacturing company, and quite probably a photographic process will be used in the course of their manufacture. If a few specialised designs are required in connection with design or development work it will be both quicker and easier to make them in the photographic department. This is another and very large subject that it will not be necessary to delve into to-day, beyond mentioning that there are several transfer processes which enable an image to be transferred on to any required support, such as glass or metal, while suitable designs can often be obtained up without even transferring the image.

Then in the preparation of instruction leaflets, other published data, diagrams and drawings frequently need to be reproduced. It may only be necessary to supply the designs to the printer, but if the matter is to be duplicated or printed on an office press machine it may be desirable to prepare one's own stencils or printing plates. The quality of negative required for this type of work is quite different from that required when copying large plans for subsequent enlargement, but is nevertheless within the scope of the same photographic department.

A recent development likely to be of rapidly increasing importance is the application of photography to the production of templates, jigs, actual sheet metal etc. The usual technique has been for a skilled draughtsman to lay-out and scribe the design by hand on to a required metal or other surface, taking his dimensions from the drawing, then to cut out to these lines and file up the edges to obtain exact size. As thirty or more of these templates may easily be required from a

TABLE III
REPRODUCTIONS OF REPRODUCTIONS

Method	From Reproductions from Original A	From Reproductions from Original B	Remarks
ie from Brown Dyeline on tracing By direct printing	Very poor	Moderate	Ammonia developed dyelines employed
ie from Black Dyeline on airmail t paper. By direct printing	Very poor	Poor	Semi-dry developed dyelines employed. Reproductions cannot be made from dyelines on normal weight papers
ie from Blue Dyeline through negative on Reflex Paper gh yellow filter ct positive on Contact Film	Good (background a bit spotty)	Good	Positive not reversed
ie from Brown Dyeline a negative through a prism on mechanical Paper ct positive on Reflex Paper	Moderate	Good	Positive reversed
Print from Blue Print (No. 1) through positive on Reflex Paper gh yellow filter	Moderate	Moderate	Note that a print from a blue print is a positive. A Reflex positive would not have as good contrast. Positive reversed
Print from Blue Dyeline (No. 24) late Camera negative on Ortho Line Reversed enlargement on Document No. 55	Moderate	Moderate	Positive reversed
ie from Blue Print (No. 1) late Camera negative on Ortho Line ct positive on Line Film sed enlargement on Document Paper i	Good	Good	Positive reversed

Comparisons of quality have been made on the same basis as in Tables I and II. Since the dyeline and blue processes employed never give a perfect reproduction, the reproductions under consideration can never be better reproductions of the original and cannot be described as more than "Good". Any defects in the first reproduction will always be exaggerated.

ings, the time and skilled labour required is a great item. Consequently, if the design can be transferred to the metal in a semi-automatic manner and sufficient accuracy by photographic or other means, the saving will be very real, and any reasonable expense on plant or special photographic staff will be justified.

After construction in the United States it has become most standard practice to draw the whole full size on metal or wooden sheets butted together and as this is frequently done on the floor, for example, it has been termed lofting (18). Each sheet is then broken down to smaller drawings of the various parts, showing their details of construction. This master set of drawings being on an un-stretch base cannot be reproduced by the xero-printing methods, and, in any case, such reproductions would be of no value because they could not be enlarged accurately to size to within a sufficiently small margin which it is considered should not exceed one-tenth of an inch per foot, that is, on a ten-foot maximum error of one-hundredth of an inch between the extreme reference points. It therefore

became obvious that other methods of duplication had to be devised, the first being that due to the Glenn Martin Co. Inc. (19), who took the sheets from the loft floor to a large camera, made reduced negatives on glass plates, and, after processing, re-projected these in the same camera on to the required metal sheets which had been sensitised with a silver photographic emulsion spread on them by a special swabbing technique. It will be seen that this method follows exactly the technique previously discussed of making a reduced negative and subsequent enlargement, but, of course, with many added precautions aimed at ensuring accuracy to size. Since this method has survived the searching test of large scale commercial production, and the Glenn Martin plant has been subsequently enlarged (20), it follows that the required accuracy has been achieved, and others need not hesitate to follow along the same or similar lines.

Obviously, if purely contact methods could be devised they ought to be even more certain of achieving the required degree of accuracy, but they would lack the elasticity of the camera method. Thus a camera will enable accurate scale models to be prepared from the same original negatives or a known variation in size can

be introduced for the preparation of dies. Similarly, it is easy to block-out temporarily any unwanted detail on the negative so that several different templates can be cut from one composite original drawing without danger of mistakes occurring in the workshop.

Among the non-photographic contact methods which have been proposed is that of the Lockheed Aircraft Corporation (21), who use galvanised iron sheets coated with an insulating paint on which the design is scribed, thus leaving the metal bare. This design is brought into contact with a sheet of terplate wetted with ferrous sulphate solution and placed in a press at 50lbs. per square inch pressure, when a current of 6 amps is passed for ten seconds. A black deposit of sulphate of iron is formed on the terplate which is then washed, dried and sprayed with lacquer to protect the lines. Westland Aircraft Limited (22) scribe the design on to an aluminium sheet in such a way that the burr will carry ink and transfer it on to the desired surface in a 6ft x 2ft. rubber-faced platen press. The metal to receive the design must be sprayed with white paint, to make the image visible.

An ingenious lithographic process has been devised by E. S. and A. Robinson Ltd., of Bristol (23). A suitable grained aluminium plate is coated with a colloid, and on this the draughtsman makes his drawing in pencil. It is then inked in with a special light sensitive ink, exposed to light, inked up and developed in the usual lithographic manner and then printed by running through a simple press in contact with a metal sheet coated with a tacky offset or transfer layer. These layers are separated and the transfer run through the press again in contact with the surface on which the final design is required. The operations are simpler than appear from the description, and may easily prove popular.

Naturally we are more interested in the photographic techniques, for which it is necessary that the metal or other surface shall be in some way photographically sensitised. An apparently simple method which has been carried out commercially is to spray the photographic emulsion on to the surface, but it will be appreciated that a number of serious problems must arise if satisfactory and consistent results are to be achieved. In addition, to silver emulsions, a type of dyeline mixture which can be spray coated is also available (24), and might prove very useful for contact exposures.

Since handling and coating silver emulsions suitable for enlarging is a bit of a problem, the idea has been developed of transferring a pre-coated layer of emulsion on to the metal sheets or other surfaces it is desired to sensitise. This was first advocated by Eastman Kodak in the States, and a closely similar product is now available here, known as Kodak Transfer Sensitising Paper (25). Very briefly, the surface to be treated is sprayed with a cellulose lacquer, while the coated paper consists of emulsion on a stripping layer and overcoated with a cellulose layer. This cellulose top layer is caused to bond on to the cellulose on the metal by squeegeeing the two together with the aid of a thin layer of a softener introduced between them just prior to squeegeeing. As soon as they are firmly stuck, the base paper originally carrying the emulsion can be stripped off.

Another method of transferring the emulsion is by means of Ilford Template Transfer Paper, which is a product related to Ilford Dry Transfer Paper, and can be mounted on any surface by means of a suitably compounded gelatine adhesive, the squeegeeing being carried out so that the adhesive does not wet the backing paper. This material has not been available sufficiently long to have been widely used, but is very simple to handle on either a small or a big scale.

Having transferred the emulsion to the metal it can be

exposed by enlargement or by contact. For example, North American Aviation Inc. have used the Eastman Kodak Matte Transfer Film to sensitise their sheets (26), the design having been scribed on to a metal sheet coated with a fluorescent lacquer. The lacquer is then made to fluoresce by exposing for a time to a small X-ray tube, and is placed in contact with the sensitised metal in a vacuum frame; the emulsion is developed to produce a negative image in which the scribed lines appear as clear lines on a dark ground. Probably the most popular technique at the moment is that employing the camera in conjunction with metal sensitised by the transfer method, although it appears that only very limited amounts of production work along these lines have been undertaken yet in this country. Sir Roy Fedden's British Technical Metal which has recently returned from the States (27) is impressed by some of the American methods, and other proposals suggest that a standardised method of metal sensitising and photographic reproduction should be adopted and appears to favour the camera technique because of its adaptability.

It is not yet certain, however, that some application of the reflex copying method will not prove to be practical so soon as it has been developed. By using glass plate, such as the Ilford Reflex Plate, in contact with the design drawn on metal and exposing through the glass, a printable negative can be obtained which can be printed down on to a sensitised metal sheet, made to accurate size. Glass may not be the most suitable support, but it will be seen that there is scope for the development of a simple but effective technique.

As a matter of interest it may be mentioned that the Ilford Reflex Plate is a new product consisting of a pigment layer overcoated with a reflex type of emulsion which is exposed through the back. The pigment acts as a diffuser and has little effect on exposures from the completed negative.

If, as seems likely, processes such as the above developed in other industries than aircraft production, then photography must come more and more closely into contact with the drawing office, and it will have its influence on the draughtsman's technique, since in many instances methods will have to be adapted to the copying process in operation.

Having very briefly and somewhat inadequately skimmed over the various processes which have been employed, and the quite wide applications which photography can have in the drawing office, I wish, in conclusion, to express my appreciation to Mr. G. B. Harding, of Ilford Ltd., for his co-operation in preparing a number of the reproductions from the original drawings and to Mr. Hamilton Harris, of Messrs. J. Halden Ltd., for the Ferazzo prints and some of the dyeline blueprints and dyelines. The remainder of the specimens were prepared at Ilford Limited.

Discussion

DR. BATELEY referred to Mr. Tritton's mention of the desirable good contact type of photographic reproduction process. The recently introduced reflex plate provided a satisfactory means of doing this for relatively small sizes of work, but for the very large involved, for example, in aircraft manufacture, these reflex plates become too costly to manufacture and rather impractical in use because of the difficulty of securing good contact over so large an area. Nevertheless, a process is known to be in use in America whereby the user of the process makes up his own reflex plate, in sizes possibly up to 10ft. x 5ft. by coating ordinary reflex copying paper on to large plate glass sheets. This is used to form a reflex negative which may afterwards be used for printing on to sensitised metal. Several of these plate glass sheets are in use at any one time, the paper negative being peeled off and used when all the prints immediately required have been taken off; it

may then be used again. Although actually in use, this did appear rather clumsy.

More attractive reflex process has now become possible with the use of transfer sensitising paper. This may be exposed in the original drawing on lacquered metal, the image being on the paper emulsion layer by reflex printing. The transfer paper is immediately laminated down to the prepared sheet of metal on which reduction is required, allowed to dry and then the temporary paper is stripped off. The emulsion layer adhering to the metal is exposed in the usual way, giving a negative image which, however, is laterally reversed. The known dimensional instability of the paper does not interfere with the accuracy of reproduction by this process as there is no opportunity for it to enter; although in the case of a latent image, the paper itself has negligible opportunity for distortion, and never enters the processing solutions. In the case of the original drawing, a considerable amount of experience with the process has indicated a dimensional accuracy approaching the 1001 inch per foot which the aircraft industry demands.

The process is economical in labour and in the fact that no intermediate negative is prepared.

THE SOCIETY said with regard to the question of instrument dials, that the use of photographic methods for this purpose, and had with them which had been made using Kodak Transfer Sensitising emulsion on the metal.

THE SOCIETY proposed a very hearty vote of thanks to Mr. Tritton for his summary of the processes now available to the draughtsman-photographer, which was accorded by acclamation.

THE SOCIETY, in acknowledging, said that there was a great deal of work to be done in the template method during the next year and when all sorts of people had pooled their ideas somebody would give a more satisfactory summary than he had been able to do.

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RETOUCHING AND FINISHING

Retouching and Finishing of Photographs. By J. Spencer. Fourth Edition. Sir Isaac and Sons, Ltd., and Henry and Co., Ltd., London, Price 6s. net.

It has passed through three editions and, in addition, has been printed on no less than four occasions, obviously providing some-thing for the photographer wants. Retouching and finishing are practical and have taught to do with or controversies. This is a book from cover to cover, which lies the explanation of its popularity and its survival over years. There are two sections: the first dealing with negative retouching, and the second with retouching in monochrome and colour. The tools for the job are described and the preparation for the work, the work itself. The ground-work is masterly, no essential detail omitted, yet at the same time it is obviously scope for the personal predilections. At the end of the book it is the command practical aspect of the work is kept well in the fore-

front, the subject is treated seriously and, in fact, professionally, so that whether the reader seek information on some single point, or desires guidance and tuition over the whole course, it is here at his service.

H. W. GREENWOOD.

Photography Without Tears. By Marcel Natkin, D.Sc. The Fountain Press, W.C.2. Price 3s. 6d. net.

This is a new edition of a most useful guide to the beginner in photography. That ten thousand copies have already been sold tells its own story, and it can safely be said that there is plenty of room in the ranks of photographers for many thousands more copies of "Photography Without Tears" to be read with care and attention. Although this is a delightfully illustrated book, with a well-written commentary on its pictures, it is also something very much more. It is a guide to sound photography written by a master and illustrated by 99 reproductions of photographs, every one of which has a story to tell and a lesson to inculcate. This new edition is very welcome.

H. W. GREENWOOD.

The "Wellcome" Photographic Exposure Guide

An announcement received from Burroughs Wellcome and Co. indicates that they have available a new and revised War Emergency Edition of the "Wellcome" Photographic Exposure Guide, the previous issue of which has been of particular interest to many amateur photographers who are endeavouring to "carry on" during these difficult times. Those who have in past years used the "little green book," as the "Wellcome" Photographic Handbook and Diary is known to hundreds of thousands of users, will find in this new Exposure Guide many of the most valuable features of the former publication which, because of war conditions, is temporarily in abeyance.

The edition will be limited and it is unlikely that it will be possible to reprint. A brisk demand is expected and readers are urged to lose no time in ordering from their dealers.

* * *

Other book reviews will be found on pp. 348 and 351.

PHOTOGRAPHIC ASPECT OF RADIOLOGY—II

A Symposium on the photographic aspects of radiology was held on November 21st, 1942, at Prince's Gate, S.W.7. The meeting was arranged jointly by the Industrial Radiology Group of the Institute of Physics and the Scientific and Technical Group of the Society. Dr. H. Baines, F.R.P. Vice-President of The Royal Photographic Society, was in the Chair.

Mr. H. P. Rooksby, B.Sc., F.Inst.P., read a paper entitled "Film Shrinkage in X-ray Analysis." Mr. E. E. Smith, B.Sc., A.Inst.P., followed with a paper, "Dependence of Photographic Sensitivity on X-ray Quality." Mr. G. F. G. Knipe, B.Sc., then read a paper, "The Sensitometric Estimation of Radiographic Exposures," and the meeting concluded with a paper by Dr. R. H. Herz, F.Inst.P., "So Fundamental in the Processing of X-ray Films."

The last two papers are included in this issue; those by Mr. H. P. Rooksby and Mr. E. E. Smith were published last month (pp. 299-306).

THE SENSITOMETRIC ESTIMATION OF RADIOGRAPHIC EXPOSURES*

By G. F. G. Knipe, B.Sc.

* Communication No. H 921 from the Kodak Research Laboratories

WHERE radiographs have to be made of specimens having a range of thickness, the thickest section should be represented by a density of 0.5 and the thinnest by a density of 2.5.* Sets of absorption curves should be made to enable the correct kilovoltage and exposure time to be found rapidly.

Introduction

The normal exposure charts used in radiography give the relation between exposure in milliampere-seconds and the thickness of metal being penetrated, in order to obtain a pre-determined density. A set of curves is usually given on the same chart for different kilovoltages. A typical chart of this type is shown in Fig. 1. By measuring the thickness of metal in the specimen and knowing from experience the correct kilovoltage, the operator can determine the correct exposure.

These charts are fairly satisfactory when only a single thickness of metal is being examined, but difficulties arise when a fair range of thicknesses has to be recorded on a single radiograph. Usually the correct kilovoltage cannot be determined at

once, and a series of kilovoltages must be tried until the radiograph appears correct on inspection. Even then the best conditions may be missed as the radiograph which has the best appearance may not really give

optimum fault detection. In addition, the exposure charts are affected by various factors, such as:

- (a) the X-ray unit;
- (b) the material of the specimen;
- (c) the film;
- (d) the screens (if used);
- (e) the tube-film distance;
- (f) the desired density range.

(a) and (b) are fixed; alterations to (c), (d) and (e) may be corrected but the corrections involve time, and it would be worth drawing up a new chart. (f) is fixed by reference to the optimum density range, and necessary corrections can be made by reference to the characteristic curve of the film. Incidentally, screen exposures do not take any account of the failure of the film. The chart is also affected by processing conditions such as the composition, temperature, agitation, and exhaustion of the developer, all of which must be within close limits if reproducible results are to be obtained.

Although it is theoretically possible to expose a separate film for each important thickness of material, in practice, except in weld radiography, considerations of economy and material make it necessary

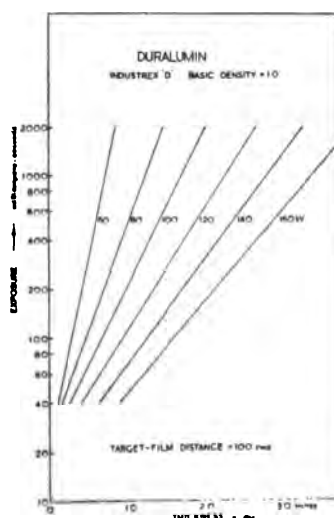
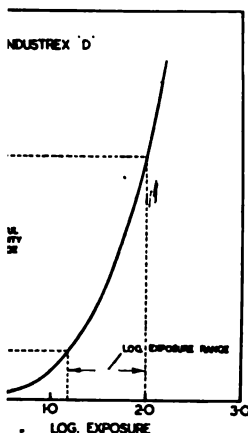


Fig. 1. Typical exposure chart for Duralumin

range of thicknesses on a
1, and it is then essential to
e kilovoltage and exposure
to obtain the best results, if
ntrol is to be kept on the
f radiographs. Therefore it
le to obtain exposure charts
is thickness ranges with the
t and film used under those
; which will be used in
eration.

Density Range .

section of small defects
on the visibility of small
ferences and it is, therefore,
: to know the smallest
ensity difference, how it
th density and over what
lensity good fault detection
btained.
adiographic detection of
ends on :—
sensitivity of the film ;
sensitivity of the eye.



Characteristic curve of a non-screen X-ray film

acteristic curve of a film is
by plotting density against
thm of the exposure. The
of the film depends on the
his curve, the steeper the
reater being the sensitivity,
density difference corres-
o a given difference in log.
is thereby greater. The
stic curve shown in Fig. 2
reen film.

ower densities, the slope is
ch means that smaller
ferences will be produced
difference in exposure, and
shadows will be obtained
l defects in the specimen.
own more clearly in Fig. 3,
slope of the characteristic
ig. 2 is plotted against the
the film. Curves are also
for screen-type film used

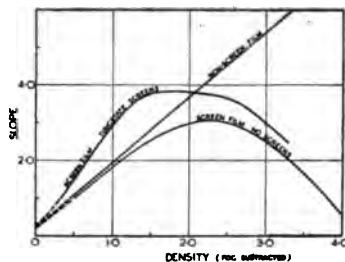


Fig. 3. Curves showing the slopes of three types of X-ray film at different densities ("Industrex" Type "D", "Industrex" Type "S", and "Industrex" Type "S" with Ultra Speed Screens)

with and without screens. It will be
seen that for no-screen film the slope
increases continuously with density up
to very high densities. Screen
film used without screens has a
similar slope at low densities to that
of no-screen film, but a maximum is
reached at a density of about 2.2,
and above this density the slope falls
again. Used with tungstate screens
the film has a higher slope at the
lower densities reaching a maximum
at a density of about 1.8. Above
this density the slope again drops
slowly. The lower limit of useful
density is not readily defined, but it
appears that the part of the charac-
teristic curve below a density of 0.5
should not be used for satisfactory
fault rendering, as the slope is then
less than 1.0, compared with values
of 3.0 or more at higher densities :
so that at a density of 0.5 the fault
detection has dropped to less than
one-third of the optimum. This
lower useful density limit may be
reduced to 0.3 when screens are used
because of the increased contrast
under these conditions. Naturally,
the use of screens entails a lower
general standard of definition, but for
some work this has to be accepted.
These figures may be taken as a
satisfactory general guide, but cir-
cumstances may exist in which
departures from them may be
desirable.

At the higher densities the slope is
not less than 1.0 below a density of
3.5, and densities above this cannot
be viewed on normal illuminators, so
that limitations of viewing will
operate first in this region.

The sensitivity of the eye to small
brightness differences is shown in
Fig. 4, from data by Koenig and
Brodhun, which indicates that the
eye can detect brightness differences
of the order of 0.01 on the density
scale within a range of approximately
one candle per square foot to 1,000
candles per square foot, the limits
being set by the loss in sensitivity of
the eye at low levels of illumination,

and by the glare causing loss of
contrast at the upper levels.

Commercial illuminators have a
brightness ranging from 30 to 150
candles per square foot, and where a
high intensity lamp such as a
"Photoflood" is fitted, about 1,000
candles per square foot is available.
With the usual illuminator of bright-
ness 100 candles per square foot, it
was found, as would be expected from
the above curve, that density
differences of 0.02, which have been
suggested as a criterion of sensitivity,
could be seen up to a density of
approximately 2.5, and this is
suggested as a practical maximum of
useful density.

Unless the illuminator brightness
exceeds 100 candles per square foot,
very little trouble will be experi-
enced with glare, but in any case
viewing is less fatiguing if the
illuminated screen is diaphragmed
down to the size of the area to be
examined. When a high intensity
illuminator is used, diaphragms are
essential if glare is to be avoided, and
with these illuminators the upper
limit of density may be extended to

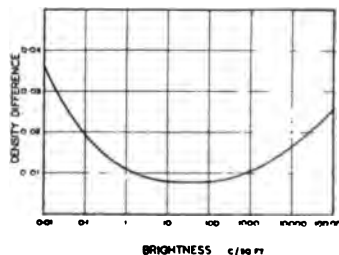


Fig. 4. The sensitivity of the eye at various brightness levels

3.5 or 4.0. In this way for a film of
given contrast a wider exposure range
may be recorded and viewed. Thus
the range of specimen thickness may
be increased, or, alternatively, a
higher radiographic contrast may be
obtained by reducing the kilovoltage
of the radiation.

The above figures for highest and
lowest permissible densities above fog
were obtained with a film having a
low fog density (0.15). A high fog
level reduces the resulting slope of the
characteristic curve of the film
slightly, but with a more marked
effect when the fog density exceeds
about 0.8. It also reduces the
illuminator brightness, an increase of
density of 0.3 being equivalent to a
decrease of 50 per cent in illuminator
brightness. As most illuminators
have a relatively low brightness, this
effect is serious, and it is important
to minimise heavy fog by correct
processing and by reduction of
scattered X-rays.

There is, therefore, a range of densities over which fine detail can be seen in the radiograph, the lower limit being fixed by the loss in contrast of the film at low densities and the upper limit by the loss in sensitivity of the eye at the low brightness corresponding to high densities. Fig. 5 is from data obtained by Neeff, and shows the relative visibility of small density differences of 0.01, 0.02 and 0.03 over the range of density 0 to 3.0. The broken line represents the visibility of a three per cent penetrameter step. Neeff does not mention the brightness of the illuminator used, but it appears to be rather low, as he was unable to see the three per cent step above a density of 2.2. Using an illuminator of brightness 150 candles per square foot, the author has found that two per cent penetrameter steps (density difference=0.04) are visible up to a density of 2.8. The curves, however, illustrate the interesting fact that the optimum density for small density

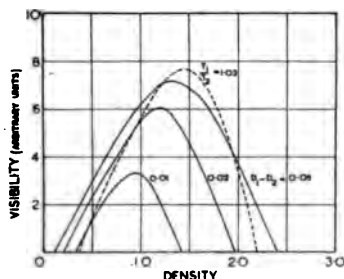


Fig. 5. The variation in visibility of small density differences with density

differences is lower than for larger differences. The optimum density in this case is between 1.0 and 1.5, but this would vary depending on the illuminator brightness.

Exposure Range

Corresponding to the above useful density range, there is a definite exposure range which is practically constant for any given film (Fig. 2). The shape of the characteristic curve is very little altered by alteration in the quality of the X-rays used, i.e., by alteration in kV. (Bell, 1936). The alteration in contrast in radiographs is due to the varying penetration of the specimen, and is not found in, for example, a time-scale of exposure. By alteration of kilovoltage, combined with filtration if necessary, the penetration of the specimen can be altered to give a large exposure range (at low kilovoltages), or a small exposure range (at high kilovoltages). By correct choice of kilovoltage, the exposure range produced can be made equal to

that required to give the full useful density range. This procedure is equivalent to change of subject contrast in ordinary photography. When the exposure range has been fixed, by fixing the kilovoltage, the right exposure time must be chosen to obtain the correct range of densities. It should be pointed out that a high contrast film may be used with high kilovoltage to produce a radiograph practically identical with another using lower contrast film and lower kilovoltage. Low contrast films are usually of higher speed than those of higher contrast, but if a higher kilovoltage can be used, a greater X-ray output is obtained so that the final difference in exposure time will be small.

Thickness Range

If full use is to be made of the latitude and contrast of the X-ray film, the range of thickness to be represented should be spread over the full useful density range of the film. For example, if a piece of metal one inch thick, with webs half-inch thick, is to be radiographed, the parts one inch thick should be represented by the lowest useful density, and the parts half-inch thick by the highest useful density in the final radiograph.

In this way, the optimum fault detection is obtained where a range of thickness has to be covered in one exposure. Where only a single specimen thickness is important, as in weld radiography, the optimum density is somewhere between the above limits. Using an illuminator of brightness 150 candles per square foot, and taking the average of ten observers, it was estimated that the finest detail could be seen at a density of 1.8 (including a fog density of 0.15), the sensitivity falling off slowly for higher densities and rather more rapidly for lower densities. In this case, the lowest kilovoltage would be used at which the specimen could be penetrated, and the above density obtained in a reasonable time.

It should be remembered that although the best possible use is made of the film properties in this way, if an attempt is made to cover a very great thickness range in one exposure, the sensitivity of fault detection may drop too much, and a penetrameter or some such means of checking the sensitivity should always be used. This also ensures that careful control of the exposure conditions is not invalidated by poor processing.

Since very small defects will not be revealed in the radiograph when using a low contrast technique, such a method is sometimes used to differentiate between relatively large and very small defects. In this way, the

interpretation of the radiograph be simplified in that only defects of size considered important will be seen in the radiograph. However, small cracks or slag inclusions which may develop into dangerous flaws when the part is cyclically stressed, and the method is recommended.

Practical Methods

A step wedge should be made of the material (Duralumin was used for an example) for which the exposure charts are to be obtained, in steps of about $\frac{1}{4}$ inch up to the maximum thickness likely to occur in practice.

By using a slit sensitometer, as the one shown in Fig. 6, a series of exposures may be made at different exposure times. The sensitometer

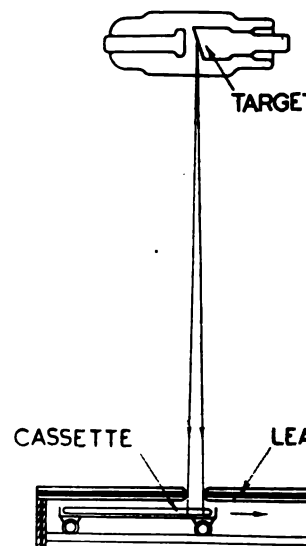


Fig. 6. Simple slit sensitometer

consists of a sheet of lead laminated plywood with a slit half an inch wide in the centre and a small trolley holder for the film cassette. The holder is moved in steps of $\frac{1}{4}$ inch at a time by an electromechanical control panel, so that the film is exposed in strips through the slit.

Normally, this apparatus is used to obtain characteristic curves by doubling the exposure for each density. Density is then plotted against the logarithm of the exposure on a normal time-scale characteristic curve is obtained which has been described before.

Alternatively, if the metal step wedge is placed over the slit and a single exposure is made, the relative densities can be measured and

thickness giving the usual density-thickness curve (Fig. 7). By turning off the thicknesses corresponding to the maximum and minimum used densities, we can obtain the ranges of thickness covered. If now a series of exposures at different exposure times (see scale) is made through the wedge, we have a crossed time-scale step wedge giving all combinations of time and thickness on a single film and the range of thickness properly covered can be determined on each of the density-thickness

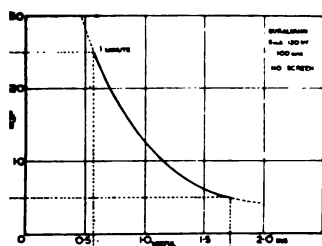


Fig. 7. Density-thickness curve obtained on the Duralumin step wedge

curves so obtained. In addition, the exposures corresponding to any thickness at a given density can be obtained. These give the necessary data for the usual milliamperes-seconds thickness exposure charts. Further as should be exposed at intervals of kV. or 20 kV. over the range of kV. to be used. These exposures can be made quite readily if a sensitometer of the type described is available. If it is not, sheets of lead can be used and moved across the cassette by hand. In this case, care should be taken to

keep the tube directly above the step being exposed, because of the variation in intensity in different parts of the X-ray beam.

Four sets of curves obtained in this way on the Duralumin step-wedge are shown in Fig. 8.

When it is required to radiograph a Duralumin specimen, the thickest and thinnest sections in the direction of the beam in which detail is required should be measured. Suppose, for example, these are $\frac{1}{2}$ inch and $1\frac{1}{2}$ inches. Referring to the set of 80 kV. curves, no curve covers the $\frac{1}{2}$ inch and $1\frac{1}{2}$ inch thicknesses. The 100 kV. curves show that the range is almost covered at one minute's exposure and would be satisfactory if a density of 2.75 were allowed. At 120 kV. the thickness range can be covered and an exposure time of between half and one minute is required, say 45 seconds, giving a density range of approximately 0.5 to 2.4.

A penetrometer placed near important parts will show if sufficient sensitivity is obtained. If it is not, the range of thickness is too great for a single exposure without serious loss in sensitivity, and the casting will have to be covered in two or more exposures, each one being exposed for a different thickness range.

A measure of the sensitivity of fault detection to be expected can be obtained without a penetrometer from the density-thickness curves in the following way. Referring to Fig. 7, it can be seen that in the region of thickness of one inch, a density difference of 0.5 is produced by a thickness difference of 0.25 inch, and therefore a density difference of 0.02

(the sensitivity criterion) is produced by a thickness difference of 0.01 inch. This is one per cent of the metal thickness at this point, and the sensitivity is therefore one per cent.

References

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Koenig, A., and Brodhun, E., *Berliner Berichte*, 1888, p. 917; 1889, p. 641. [Quoted in "The Principles of Optics," by A. C. Hardy and F. H. Perrin, p. 192 (1st Ed. London, 1932), and in Wien-Harms "Handbuch der Experimentalphysik," vol. 20, part 1, p. 67 (Leipzig, 1929).]
Neeff, T., *Zeitschr. f. Techn. Phys.*, 6, 1925, pp. 208 and 250.

Discussion

Mr. FRY congratulated Mr. Knipe on a very valuable paper, and asked whether the set of four curves related to any special film; if so, could he give the name? If they related to a special film it seemed that Mr. Knipe was returning to the old discussion of whether a contrasty, medium contrast or soft film was needed, because he was deliberately reducing the contrast by the use of higher kilovoltages. A standard of fault detection was required based on some definite contrast, this contrast being maintained for all work and all thicknesses. This brought him back to the old question of how to maintain fault detection whilst accommodating a wide range of specimen thicknesses.

Mr. KNIPE said that he used non-screen type film, and similar curves would be obtained by the use of screens.

On the point of contrast, if the kilovoltage was increased too much the contrast would fall, and a penetrometer must be used in order to see if there was sufficiently good fault detection; if not, two or more radiographs of the specimen must be taken under different conditions to ensure that sufficient contrast was obtained for all thicknesses.

Mr. KAYSER said that the subject of Mr. Knipe's paper was, at the moment, of national importance, and he thought it would always be of national importance, because there was no doubt that the use of radiography was growing. Again, he must say that this was a disappointing paper. What did it teach? It was important to have the correct exposure but he still said that if the first film was not taken at the right exposure it should be thrown away and another taken. There was no argument about that. He suggested that Mr. Knipe did not use his wedge in the right way; he mentioned $\frac{1}{16}$ inch steps, which was right as far as it went, but on each of those steps he (the speaker) suggested there should be recesses at different depths; such a wedge should be kept in every X-ray laboratory.

It was not possible for economic reasons to have highly trained specialists on work of this nature; in fact, when it came to real production and day-to-day work they might not make the best operators, because it was rather monotonous and one had a tendency to become slack. Therefore laboratories must be able to train people quickly.

To be perfectly frank he had not understood

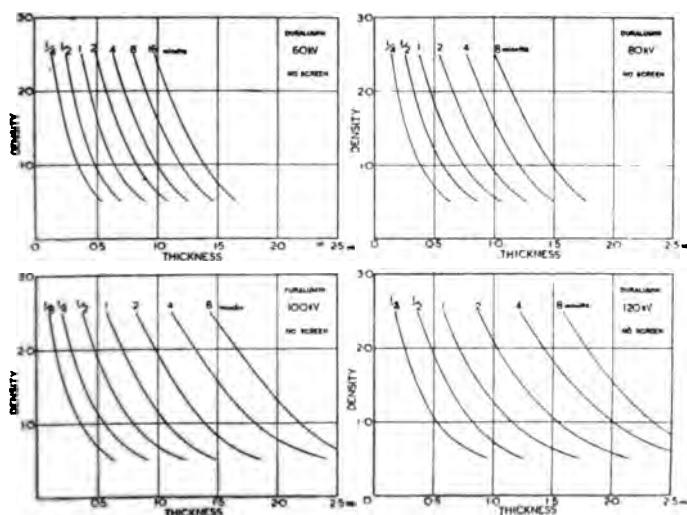


Fig. 8. Four sets of Density-thickness curves at four different kilovoltages

all that Mr. Knipe had said, and he had been reasonably well educated; but he did know how to train people to take photographs, and had done so. His firm trained their own operators on and within the limits of their X-ray apparatus, and they produced photographs equal to anything produced in London. The best method was to use a wedge whether it had steps or not; the wedge with steps was preferable, but on those steps little depressions were necessary, and then one could tell at once what kind of defects it was possible to find.

The CHAIRMAN was afraid Mr. Kayser had had a disappointing afternoon. He would not call upon Mr. Knipe to answer the first part of the question, which involved discussion on the relative merits of empirical and fundamental methods of investigation. He would ask Mr. Knipe to reply only to the question regarding the depressions on the wedge.

Mr. HARPER said that Mr. Kayser did not understand that it would not matter at all if people made unsatisfactory radiographs and threw them away, but unfortunately people made unsatisfactory radiographs and then proceeded to use them for evidence.

With regard to the other points which he intended to make, he understood the paper quite satisfactorily, and what had troubled Mr. Kayser was that Mr. Knipe dealt entirely with the angle of radiographic exposure, which, after all, was the title of the paper. It would have been perhaps a little more clear to Mr. Kayser and others who had dealt with the radiography of metals if some rather more heavy emphasis had been put on the question of sensitivity. The curves which were shown, for instance, of the increasing voltage would be rather inclined to lead to the idea that it would be better if they had a casting with a large range of thickness to use a voltage up to about 180 kV. They would be led to that because no mention was made of the fact that the sensitivity with these high voltages would be less than with the low voltages, and the correct procedure in examining a casting having sections up to, say, 2½ ins. thick would be to use voltages suitable to ranges of 1½ ins. in each half of the range, and to obtain the necessary sensitivity in each part.

There was one other thing he wished to ask and that was whether Mr. Knipe could give any information about what he considered to be the density which would give the best sensitivity in detection of faults. In the second or third slide there were some interesting curves which indicated that a density of 1.0 was the best for sensitivity. He had always tried to keep an open mind on that point, because the

various authorities seemed to differ. Mr. Knipe mentioned that densities of 0.5 would be sufficient at a lower range. He did not think that would be true because he noticed in Mr. Knipe's curves that at a density of 0.5 one was at the toe of the curve and the contrast was lower than in the straight line of the characteristic curve. Contrast and sensitivity in radiography were not quite the same thing, and the density of 1.0 was about right, but there were schools of thought which tended to densities as low as 0.7.

Mr. KNIPE said that he was afraid he had not delivered the paper very well because he had discussed these points. The density of 0.5 which he had mentioned was the minimum used and certainly not the best. The curves did show that for a fairly large fault the best density was about 1.5, but for the very smallest faults the best density dropped to about 1.0. A penetrometer must be used, and if the radiograph did not show sufficient sensitivity, the specimen must be radiographed in two stages, as Mr. Harper had mentioned. Mr. Kayser's point about the step wedges having recesses of different depths was a good one, and a wedge of this type was being used for training purposes.

Mr. HARPER thought that a wedge with constantly increasing thickness was the right one if the standard of radiographic sensitivity was being investigated. He had experiments in hand at the moment, and did not know when they would be finished, but he was proposing to use continuous wedges of the materials for which the sensitivity was required, and grooves were being cut along them corresponding to definite percentages of the thickness. He thought it was better from that point of view, but of course the step wedge was better from the film exposure point of view. He was going to try measuring from the end of the wedge with a densitometer which measured densities in areas about 1 mm. diameter.

Mr. KNIPE asked how, with varying thickness, Mr. Harper would know at what thickness he was measuring his density.

The CHAIRMAN said that the objection to continuous wedges was the difficulty of accurate calibration at any one point. One was forced to measure over an area which had some definite dimensions, and there was some point in using a step wedge in which densities were uniform over the area measured.

Mr. E. E. SMITH said that on the question of optimum density, he, together with Dr. G. E. Bell, had some years ago published a paper in the *British Journal of Radiology* which dealt with that point. He seemed to remember that with viewing screens of 100 candles per square

foot brightness, the optimum film density was about 1.2. If the illumination was more, the optimum density rose. As far as the film was concerned, while on the straight part of the characteristic, the contrast increased with increasing density, and provided one went through it, the denser it was made the better. Unfortunately, the sensitivity of the film with decreasing illumination, and the optimum density which with normal viewing screens was in the region of 1.2. With films of greatly varying density, masking arrangements should exist for viewing the light areas while the darker areas were being examined.

Dr. SPIEGLER said that there seemed some mystery about the useful range of density. It appeared to him that it was over the whole range of the straight part of the characteristic curve so long as the film was sufficient. There would not be any question in the detection of a certain density corresponding to the high part of the characteristic curve were being examined sufficient light, but there was a restriction borne in mind. Dense portions of parts should never be examined at time. Details could be seen over a certain range of density so long as the eyes were affected by light passing through lighter portions of the image.

As long as the picture was complete the differentiation between different densities would be high, and the useful density range greater, but if the picture was unsharp, density differentiation would be less. At the same time, it must be borne in mind that definition at high densities is slightly better than at lower densities. This was a phenomenon seen in any newspaper with a bad exposure.

He wished to sum up in this way the perception of details over the whole range of density, i.e., over the whole characteristic curve, would be found to be equal, provided the eye was unaffected by other density factors. The greater the sharpness the better was the density differentiation.

Mr. KNIPE agreed with regard to the light areas which must always be kept off. He did not follow the point of definition being altered by working at different densities. Good definition was obtained with densities of at least 2.5, with no screens used, although it might fall off more at higher densities.

Dr. SPIEGLER said that with heavy films there was a considerable loss of resolution. This played an important part in practice.

ASLIB CONFERENCE

ASLIB (Association of Special Libraries and Information Bureaux) will hold its Eighteenth Annual Conference, by kind permission, at the rooms of the Royal Society, Burlington House, Piccadilly, W.1, on

September 18th and 19th, 1943.

Further particulars of the programme may be obtained from ASLIB.

The Report of the last Conference, held in November, 1942, is now

ready at 3s. to members; non-members.

Communications should be addressed to the Secretary, Miss E. M. R. ASLIB, 31, Museum Street, J.W.C.I.

SOME FUNDAMENTALS IN THE PROCESSING OF X-RAY FILMS

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THE standardisation of the processing of X-ray films is fundamental to obtaining optimum results. This can be achieved by suitable replenishment of the developer solution. Reproducible results can thus be obtained, and a guide for the correct exposure can be based on standardized development. Some defects occurring during handling and processing of X-ray films are described, and special reference is drawn to those defects which might confuse the interpretation of the industrial radiograph.

STANDARDISATION OF DEVELOPMENT

Since so many variable factors are involved in the production of radiographs, it is desirable to standardise these as far as possible. In particular the processing of radiographs is so fundamental to the whole technique that every effort should be made to standardise at least these conditions. Fortunately this can be easily achieved. By so doing, high quality of properly exposed radiographs is assured, and when unsatisfactory results are obtained, the cause may be more readily determined. Moreover, such standardisation is essential for the establishment and satisfactory use of exposure charts. Modern recommendations by X-ray film manufacturers for methods of processing are based on full investigations of the factors involved in processing. It is hoped that the present paper will serve to indicate the reasons behind these recommendations.

Effect of Development Time and Temperature

The effect of a developer on an X-ray emulsion depends upon the time of development. This effect may be studied by developing equally exposed sensitometric strips of the film for increasing times under the processing conditions to be used. Fig. 1 shows a series of characteristic curves obtained in this way for a developer temperature of 65°F. The main features of importance are:—

- (a) The contrast increases with developing time up to about five minutes' development, after which it remains almost constant whatever the development time.

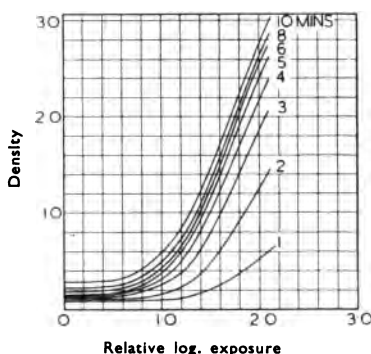


Fig. 1. Characteristic Curves of X-ray Films in Conjunction with Intensifying Screens at Various Development Times (1, 2, 3, 4, 5, 6, 8, 10 minutes)

- (b) The density corresponding to a given exposure increases for development times up to about five minutes, after which the density increase is small.
(c) The chemical fog increases with increasing development time.

This fog, which is independent of the exposure, increases the overall film density. It is seen that the optimum development conditions are fixed at five minutes' development time for a temperature of 65°F. Under these conditions the maximum contrast is reached, and the further slight increase in density obtained by longer development is off-set by an increase in chemical fog.

Since the rate of chemical processes increases with rise in temperature, it follows that optimum results are obtained in a shorter time as the developer temperature rises. Similarly, optimum results are obtained in a time longer than the standard time when the temperature is below 65°F. Experiments similar to those described, but using developer at various temperatures, show the relationship between development time and temperature for standard development. These results are shown graphically by the curve A in

Fig. 2. Accordingly, if a thermostatically controlled processing unit cannot be used, or, if for some other reason the development temperature cannot be brought to the correct value, then such a time-temperature chart should be used.

In summer, or under other hot conditions, it may be impossible to bring the development temperature within the range indicated by curve A. Even a thermostatically controlled developing unit is not likely to aid in this direction, since only rarely is provision made for refrigeration to cool the developer. When this occurs, 105 grams of sodium sulphate (cryst.) should be added to every litre of developer to prevent excessive fog formation, reticulation, frilling, or softening of the gelatin. As might be expected, this affects the development time. Curve B indicates the temperature and corresponding developing time when sodium sulphate is added.

2. Replenishment

Although a tank full of solution will develop a large number of films, every film that passes through it uses

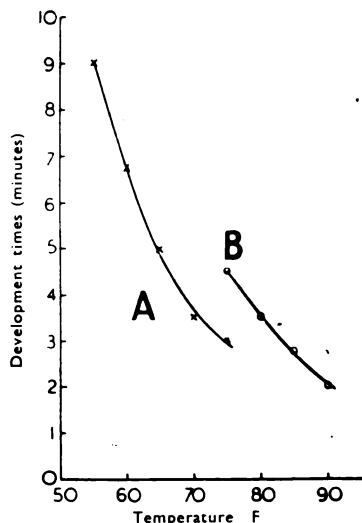
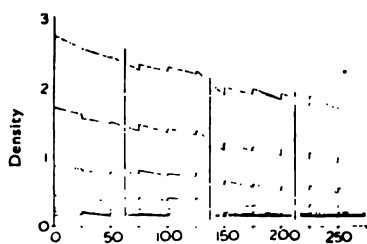


Fig. 2. Standard Time Temperature Development Chart. A—Kodak D-19b X-ray Developer. B—Same Developer with added Sodium Sulphate

up some of the active chemicals, and, at the same time, leaves behind soluble bromides which, in time, will noticeably retard development. As films are taken out of the developer, they take up about 20 cc. of developer solution per square foot of X-ray film, and in spite of careful draining the level in the tank gradually falls. It is usual in many X-ray departments to top up the tank periodically with bromide-free developer in order to replenish the developer. The efficiency of this technique has been investigated by developing equally exposed stepped density strips in the developer at various stages of exhaustion. Exhaustion was achieved by developing sheets of flashed X-ray films of average density; at the end of each stage, one of the stepped exposure strips was developed. Following this, the developer was topped up with bromide free developer and a further stepped strip was developed; exhaustion was then continued. The density of a given step on the wedge was then plotted against the quantity of films which had been developed (see Fig. 3). Thus, at each stage, the lower point represents the density for a given exposure when the film was developed in partially exhausted developer, and the upper value gives the density for the same exposure when the developer had been replenished without further exhaustion. The original volume of developer was 6½ litres, and the tests were concluded when 275 sheets (12in. x 10in.) of flashed X-ray film had been developed. The exhaustion-density relationship for equally exposed films is shown for various densities in Figure 3, from



Number of 12in. by 10in. Sheets of X-ray Film

Fig. 3. Exhaustion Test of X-ray Developer replenished with Bromide-free X-ray Developer

which the falling-off in density for any step is evident.

If, however, the tank is "topped up" at appropriate intervals with a suitable replenisher solution, the activity of the developer can be maintained, for the replenisher is so compounded that it replaces the chemicals which are used up and compensates for the restraining action of the bromides liberated from the films. The formulæ of the developer and replenisher solutions investigated are given below.

The results obtained in an experiment similar to that described in the left column, but using a replenisher solution to top up the developer are shown in Fig. 4. As seen from the graph, only a small loss of density occurs during the early life of the developer, after which the developer maintains an equilibrium between exhaustion and replenishment up to a total of 510 sheets (12in. x 10in.) of X-ray film developed. The loss at the beginning of the exhaustion amounts to about 20% in density for

densities up to 2.0, but is rather for densities greater than 2.0. losses will vary for baths exhausted with films of greater or less density than that used in the tests.

A tank full of developer may be regarded as completely exhausted and incapable of useful service with replenisher added if the volume of developer has been completely replaced by the same volume of replenisher. The amount of which can be processed under standard conditions in a tank holding gallons of solutions and per

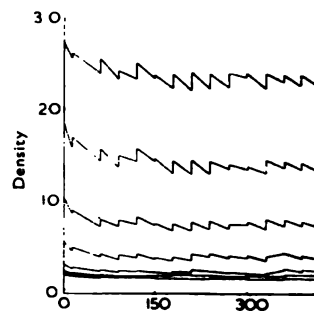


Fig. 4. Exhaustion Test of X-ray Developer replenished

replenishment can easily be calculated, knowing that one square foot of X-ray film takes up about 1.5 litres of solution, that is to say, 50 sq. feet per litre or 675 sq. feet per gallon tank. Summarizing, we say that by the combined use of a suitable X-ray developer and replenisher, a standardisation of developing conditions is possible.

KODAK D-19B

Metric	X-ray Developer				Avoirdupois			
2.2 grams	Elon	...	...	77 grains
144	Sodium sulphite, crys.	...	11 oz.	220
72	(or anhydrous)	...	5	330
8.8	Hydroquinone	...	...	308
130	Sodium carbonate, crys.	...	10	175
48	(or anhydrous)	...	3	368
4.0	Potassium bromide	...	...	140
40 cc.	(or 10% solution)	...	3	96 minims
1000 cc.	Water to make	...	80	...

Dissolve the chemicals in the order given. Use without dilution.

KODAK D-19B

Replenisher for Formula D-19b

Metric	Stock Solution				Avoirdupois			
4.0 grams	Elon	...	...	140 grains
144	Sodium sulphite, crys.	...	11 oz.	220
72	(or anhydrous)	...	5	330
16	Hydroquinone	...	1	125
130	Sodium carbonate, crys.	...	10	175
48	(or anhydrous)	...	3	370
7.5	Sodium hydroxide	...	...	260
1000 cc.	Water to make	...	80	...

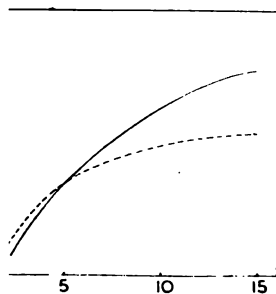
Dissolve the chemicals in the order given.

ect Exposure Time

appearance of a film during development may be a valuable guide in determining the correct exposure. It is of advantage when the exposure of a specimen can be only

Suppose that the correct exposure time for a given specimen is known, and a first trial exposure is made. Assuming experience gained in judging densities in the processing procedure, the exposure time required to obtain a given density on the film may

This time is then related to the exposure factor by the graph in Fig. 5. The development time is plotted on the abscissa scale, multiplying factor with which the exposure time is to be multiplied in order to obtain the correct exposure for standard development is on the ordinate scale. The curve represents the values for screen and the dotted curve for salt screen exposures. The exposure for screen exposures differs



Development times (minutes)
Determination of Exposure Time Factors
Using Times required to obtain Average
Densities. Full line: Exposure to
Screen Light; Dotted line: Exposure to X-rays and
Screen Light

from that for direct X-ray exposure, owing to the different characteristics of the latent image under the two circumstances. For a non-screen exposure the exposure time should be halved by 0.5. Thus the exposure time should be halved in order to obtain a radiograph which can be developed to its optimum contrast. If the film is not the trial film is from the developer when the film is apparently complete and upon the operator. In the film may be rinsed and immediately the end stage is reached. Alternatively, the film may be developed for the standard development time this has not already been done, and finally chemically

reduced to a useful density range if the trial exposure is to be used for interpretation. The latter method is preferable, since higher contrast is obtained.

Some workers have suggested that better results may be obtained by soaking the film in water before development. Since theoretical considerations of this technique are complicated, a practical investigation has been made. Comparative sensitometric tests at various development times have been made by placing films of the same batch and exposure in water before developing, and by direct development without pre-soaking. The results of these tests are shown in Fig. 6, which illustrates characteristic curves of films pre-soaked in water before development, and immediately afterwards developed for 2½, 5, 7 and 10 minutes. The dotted curves represent the result for the film strips which have been developed without pre-soaking, whilst the full-line curves show the results obtained when the film strips have been pre-soaked in water for 5 minutes. As can be seen from these curves, a slight advantage in the higher densities only is gained at 2½ minutes' development time, whereas direct development is to be preferred for the optimum development time of 5 minutes and still longer development times. It is evident, therefore, that the advantages of pre-soaking are confined to short development times, and even then they hardly compensate for the trouble of the extra operation.

II. DEFECTS OCCURRING DURING HANDLING AND PROCESSING OF X-RAY FILMS

Defects on films may arise at any stage between the arrival of films in the X-ray department and the time when they appear as finished radio-

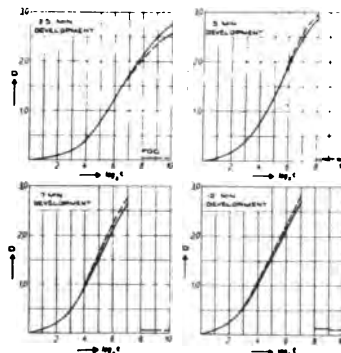


Fig. 6. The Effect of Pre-Soaking. Full line: Pre-Soaked. Dotted line: Non-pre-soaked

graphs. During all these stages, many details have to be observed in order to avoid blemishes or artifacts in radiographs. Very often the X-ray film or the X-ray unit is held responsible for faults which are, in fact, due to incorrect handling and processing procedures. The possibility of faults is inexhaustible and in order to be brief, only passing reference will be made to those defects which, although they interfere with the radiograph as such, are not likely to confuse its interpretation. Special attention, however, will be drawn to those defects which might confuse the diagnosis of the radiograph.

In some departments insufficient care is taken in protecting X-ray films from X-radiation when they reach the department and whilst they are stored. Whether the film fogged in this way will be unserviceable depends on the nature of the fogging, and the appearance of several sheets



Fig. 7. White Marks due to Pressure before Exposure

of film showing the same defect usually leads to the early detection of the cause.

When loading film in the cassettes, the film should be withdrawn from its packet in its paper wrapping, and care must be taken to ensure that the film and the paper do not rub against one another. Otherwise friction and thus electrical discharge occur, which cause the so-called "statics." It is of greatest importance to avoid local pressure, as may be caused, for instance, by finger nails, by buckling, and by bending the film. A typical example of pressure marks (Fig. 7) occurred when a high tension insulator was being examined. The film in a light-tight packet had to be placed inside the cylindrical insulator, and packing with lead sheet was necessary. The resulting film showed the image of a figure "seven" suitably underlined. This suggests undoubtedly the presence of a raised figure seven on the specimen. Such stress



Fig. 8. Black Marks due to Pressure after Exposure

marks particularly occur when the film is unprotected by a cassette. Black pressure marks on the image are likely to be more confusing as is shown in Fig. 8. The pressure marks might, in some cases, be taken for fine cracks. Pressure marks produced before exposure usually show white marks, whereas those made after the exposure appear dark. Very severe pressure marks before exposure will appear as dark marks surrounded by less dense regions; these are usually associated with evidence of the buckling in the surface of the film.

In loading the films in the cassettes or hangers, fogging sometimes occurs due to faulty safelights. This defect, though objectionable for many reasons, is not likely to give the radiologist any trouble when the finished film is viewed, provided that the fogging is uniform. Fig. 9, however, which is a radiograph of an aluminium alloy casting, shows darker areas, which may be taken for suspected faulty parts in the specimen, but actually they have been caused by inspecting the film too near a safelight lamp whilst being developed. The slit of the lamp where the safelight filter had to be inserted had not been properly closed, and thus white light escaped through the slit. The efficiency of safelight lamps should be checked periodically by deliberate exposure of a piece of film, part of which is protected by black paper, for two minutes at a working distance of three feet from the safelight.

A common processing defect is due to splashes of water, developer, or fixer on the film prior to development.



Fig. 9. Light Fog through Slit from Safelight Lamp

Whereas water and fixer splashes produce lighter regions on the film, developer splashes before development show as dark areas, which sometimes give the appearance of porosity or voids. Figure 10 shows the effect of developer splashes on a radiograph of a light alloy casting. A less frequent defect which may be confusing is due to metal dust from the operator's sleeve falling on the film during development. The metal causes precipitation of silver in this region, and the resulting radiographic appearance is similar to that



Fig. 10. Developer Splashes on Dry X-ray Film

of fine porosity, as illustrated in Figure 11.

If the film is suspended in a still



Fig. 11. Silver Reduction through Contamination by Metal Filings in the Developer

tank of developer and left undisturbed throughout the whole of the development period (which is unfortunately a frequent occurrence in some darkrooms), the resulting radiograph may show streaks due to uneven development, as shown in Figure 12, which might in some cases confuse the interpretation of the radiograph. Uneven development of this type is more likely to be revealed when the development time is re-



Fig. 12. Streaks due to Uneven Development

duced to compensate for exposure or for too high a development temperature. Development agitation may also result in the appearance of so-called "flow" marks, which occur particularly in radiographs containing adjacent areas of very high and low density. An example of that kind is shown in Figure 13. As the image develops, silver bromide is liberated, and, removed by agitation, flows down the face of the film, locally resuming development below the blackened area. The reverse can also happen in normally unexposed areas of the film made by the silver bromide formed in the regionally exposed will increase the intensity of the used developer, causing it to sink and make room for the more active developer above. This influx of active developer brings about a relatively reduction of the remaining silver bromide, and causes a dark form below the light area, as shown in Figure 14, which represents a defect which has been artificially produced.

When the films are first in



Fig. 13. Flow Marks below a Region of High Density

should be vigorously agitated down and sideways for a few days, without taking the film out of the developer solution. This brief agitation should be repeated at intervals of one minute until development is completed. If such frequent agitation is impracticable, a mechanical stirrer or a suitable type of circulation pump (made, for instance, of stainless steel, wrought iron or brass, which are not chemically attacked by the developer) should be used to keep the developer in motion. It should be taken that the temperature differences between the var-baths are not too great. If the temperature of the developer is much above 70°F., the emulsion on the film may become so swollen and brittle that it is easily damaged, or it wrinkles up into a fine network of lines called "reticulation." Although this fault usually will not



Fig. 15. Reticulation caused by Sudden Changes of Temperature during Processing



Fig. 14. Flow Marks below a Region of Very Low Density

interfere with the diagnosis of a radiograph, it has been shown in Figure 15 for those to whom this is not known.

Defects which occur through inefficient fixing will mostly be recognized as such. Drying marks, however, are sometimes very troublesome. Drying has an important bearing on the quality of the finished radiograph. Drying marks may occur in a region of an important part of the image of a specimen, and then may be mistaken for flaws in the specimen. Drying marks of that type which are shown in Figure 16 can easily be recognized as such if both sides of the film are inspected by reflected light. Drying marks can be avoided by uniform drying of the whole area of film in a dust-free atmosphere.

By wiping the emulsion surfaces with a damp, viscose sponge, before drying may be recommended in exceptional cases. As a general rule, for diagnosing drying film processing or handling marks, inspection of the film both by reflected and by transmitted light is recommended. This inspection by reflected light will indicate whether a fault is only visible on one emulsion side or on both. If the film defects appear on both sides it should

be checked whether two faults on both emulsion sides coincide. Faults occurring only on one emulsion side are certainly not caused by the influence of X rays, but if the faults coincide on both sides they most probably are due to radiation. Thus, by systematic exclusion of certain faults, the causes of various handling and processing defects on films may be established.



Fig. 16. Drying Marks

Discussion

Mr. ROOKSBY said that Dr. Herz had mentioned the question of drying films, and had said that in exceptional cases one should use a viscose sponge. He thought it depended on where one lived. If he were located in the Colne Valley it would be desirable to apply a viscose sponge, while in Manchester the film could be lifted out of the water and hung up to dry, and there would not be any mark upon it. This raised the question of whether the difficulty of white deposits could be got over by wiping off the residual moisture. This was particularly relevant to the London area. When handling

the film the white deposit scratched and smeared. Had Dr. Herz any suggestion?

Dr. HERZ said that he had mentioned that only in an emergency or exceptional case should one use the viscose sponge, because it was not usually done in practice. According to his experience, he must admit that he occasionally got very fine drying marks, and it was sometimes difficult to avoid them. One should be very careful to see that the air draught in drying cabinets was uniform, and that no film at the top dripped water on to the film below. He agreed that results might differ in various parts of the country.

Mr. EYLES thought there were two points about the use of the viscose sponge; firstly, any sediment which the water might leave on the film could be removed; secondly, marks appeared on the film because of different rates of evaporation at different parts. Drops of even distilled water left on films made drying marks, due to different rates of drying of the film, so that if the sponge was used to remove this surplus water, such marks would be avoided.

Mr. ROOKSBY said that he was not thinking of the drying marks as such, but rather of the noticeable deposit which was left from hard water. He thought he was right in saying that with the Colne Valley water, however careful one was, there was a deposit, whereas if the film was processed in Manchester, for instance, it could be taken out of the water and hung up and there would not be any deposit. Simply rinsing the film in distilled water did not get over the difficulty, because the emulsion was impregnated with the hard water.

Dr. CHASTON said that he also used Colne Valley water, and had recently been putting his spectrographic plates in five per cent acetic acid after washing to dissolve the deposit. He had tried hypochlorite, but thought it might attack the silver. It was his belief that his spectrometer readings made on plates, washed in this way were better. Another method was to dry the films quickly in equal parts of alcohol and water.

Mr. FRY said that a perfectly satisfactory method of drying miniature negatives was to rinse the film in distilled water and then in saponin, and then in distilled water again, with a blow down with distilled water from a wash bottle.

Mr. KAYSER said that it was not good to allow water to evaporate off the film, and as much as possible should be removed mechanically. He had found that the best thing was a cold blast, and if the films were brought out of the water very slowly, dragging off as much water as possible, and then dried by air at 60 lbs. pressure much quicker drying was obtained.

Dr. SPIEGLER asked the best method to replenish a solution. Should the daily loss be replaced with potassium bromide free developer?

Dr. HERZ replied that if the same developer was used without potassium bromide considerable exhaustion would be obtained, but if a suitably replenished solution was used, containing sodium hydroxide and no potassium bromide, one obtained constant conditions over a long period of time.

The CHAIRMAN said that it was possible to keep the activity of a developer solution sensibly constant if developer of the same formula

were added without bromide, provided that one discarded a calculated amount of developer before each replenishment.

Dr. CHASTON said that some people had recommended the use of potassium iodide to reduce chemical fog. Had Dr. Herz any information on this point?

Dr. HERZ said he had not found any advantage in this in some experiments he had made. In Canadian and American literature about processing of films exposed to gamma rays it was mentioned that about 20 milligrams per litre potassium iodide would improve the contrast. He had used it, but could not find any improvement, but, instead, a decrease in the speed of the film. He had doubled the amount,

and the result was even worse. Other people had told him it was rather a complicated method, which might be used under certain circumstances with other developer formulae to advantage, but he had used it with ordinary X-ray developer.

The CHAIRMAN said that theoretically one would not expect any great advantage, because the first film would remove the iodide by replacement of bromide. He could not imagine iodide being present in any partially used developer.

Mr. FRY asked whether Dr. Herz could give any more information on the effect of agitation developer.

Dr. HERZ replied that he usually moved the

film at least every minute, but experiments had been made with pumping devices to circulate the developer, and also with mechanical stirrer in the developer tank, and these had been found successful. He had heard of one factory using a pump to circulate the developer, and good results had been obtained. The pump chamber was either wrought iron or nickel, and it did not affect the developer. He could recommend circulation of the developer by a suitable pump.

The CHAIRMAN proposed a hearty vote of thanks to the contributors of the papers, and also to the two Honorary Secretaries who had arranged the meeting. The vote of thanks was carried by applause.

NATURE AND CAMERA*

The latest of the Focal Press series of books on photography is unique and fills a long-felt want. Many articles upon nature photography have appeared from time to time in various journals and magazines, but we have here collected into one volume, "Nature and Camera," a wealth of information on what is perhaps the widest and most interesting field of photographic art.

Robert Stevenson wrote "The world is so full of a number of things I am sure we all should be as happy as kings." This is especially true of the realm of nature, for as the author has shown, there is something for the camera throughout the whole year. The book runs to 262 pages, is attractively produced, and the 157 photographic reproductions are excellent. It is undoubtedly difficult in the layout to put page numbers to each illustrated page, but the reader will find no trouble in following the letterpress references. It is an advantage not to have titles under each photograph, as much more detail can be given in the captions referring to the subjects. The Focal Press is to be complimented upon its departure from the usual method of illustration.

It would indeed be difficult, if not impossible, to find anyone more qualified by his work than Oliver G. Pike to write such a book. His versatility is truly amazing, the result of a wide experience covering half a century, and the volume is written in a delightfully chatty style, giving the would-be nature photographer, as well as the experienced worker, many hints as to how to proceed with a diversity of subjects. He does well to stress the idea of a definite aim—making photographs tell a story is so

often lost sight of. Such a series is invaluable for teaching purposes, and often stimulates pupils to make observations for themselves. There should be no need for the question sometimes asked, "Why was this photograph taken?" Every picture in this book has a story to tell; it was taken with a definite object in view.

The author has given us all his "tips," and the little sketches drawn in humorous vein add to the value of the points he specially wishes to emphasize. One thing which stands out in his methods is his perfect understanding of animal behaviour, a subject which is demanding increasing attention and which depends so much upon field work and first-hand observation as contrasted with laboratory methods. Some folk have so-called "green fingers"; they seem to be able to make plants grow where others fail. This could be well applied to Mr. Pike, who seems able to get his animal folk to respond to his wishes. What a delightful feeling it is to go home after a day in the wilds taking one's exposed plates or films, and to be able to say that one has done no harm to man or beast.

Mr. Pike has made a splendid selection of the work of other nature photographers; he could undoubtedly have supplied from his vast store of photographs enough material to have made the book a "one-man show." His inclusion of the work of others in specialised fields of photography makes the volume all

the more attractive and valuable, especially as in his own photographs and those mentioned such full details are given of conditions, environment, camera, exposure, etc., These helpful particulars form a strong feature of the book.

It would be invidious to single out names, suffice it to say that the selection is excellent, and the examples given are the work of masters in their own particular field. It is a far cry from the farmyard and rabbit hutch to Tanganyika, the swamps of Chobé, and the Antarctic. The inclusion of the fascinating photographs as seen on pages 177 to 184 is unique, as are many others. The liberal quotations from the experiences of other specialist photographers, added to those of the author, make very interesting reading and greatly enhance the value of the photographs.

The inclusion of carefully compiled data such as various families of birds, speeds at which animals move, round the year with nature notes, together with a glossary couched in terms understandable by the merest tyro, complete a book which should appeal to a very wide circle of nature lovers, as well as those who follow the fascinating pursuit of nature photography. The Focal Press has indeed produced another very distinct addition to the growing list of works dealing with many sides of photographic art, and at a price which seems quite modest when one considers the immense amount of time, patience and skill which has been involved by the author and his fellow nature photographers from various parts of the world.

HENRY J. HOWARD.

* "Nature and Camera." By Oliver G. Pike, F.R.P.S., F.Z.S. London and New York: The Focal Press. Price 13s. 6d.

Other book reviews will be found on pp. 337 and 351

WE BECOMING TOO SIMPLE IN OUR COMPOSITION?

By G. Scott Bushe, A.R.P.S.

Following the Annual General Meeting of the Pictorial Group of the Royal Photographic Society, held on March 5th, at 16, St. James's Gate, S.W.7, an interesting discussion on Composition was opened by Mr. G. Scott Bushe, A.R.P.S. The chair was occupied by Mr. J. Dudley Johnston, Hon. Sec.

As only through the report in editorial columns of *The Amateur Photographer* that I became that the Group had had a discussion on the present trend of Pictorial photography. So that I am not sure choice of subject for this discussion—namely, whether we are going to become too simple in our compositions—was a happy one. Perhaps, it did not strike a note of redundancy for those who were at that meeting; causing them to think that a further discussion was a repetition—a re-hash—of all that had been said, and that can be said in these lines.

Never, I take heart when I remember that Mr. Dudley Johnston endorsed my proposal with readiness and alacrity. I almost said with alacrity. I almost jumped at it, in spite of the fact that, in the report I have read to, he is stated to have expressed a wish that a five-year discussion might be pronounced on the "art" side of photography. He claimed that it was worth saying on that side and by G. B. Shaw, thirty years ago. And on reading that I with all the breath knocked me, so to speak. For I was at the thought that I should not come before you to-day with re-knowledge that either what had already been said—or that what was said was not worth the saying. Five years ago I had just laid a whole of my precious savings over several years—it amounted, I remember, to \$17.50—on a Box Eye camera by Eastman Kodak Co., of Rochester, N.Y., and a "daylight" developing outfit, consisting of a box, apron and tank, a quarter-plate printing frame, and a small celluloid dishes, and a small amount of film and paper. I lived in all my blissful ignorance of photography, quite unaware that that very time was being said that there is to say about the art of Photography. Even if I had known of it, I should not, I am certain,

have turned a hair, nor have been in disagreement in any way with what was being said. For I am sure that I should not have believed that there was, would be, or ever could be, an "art" side to photography. I am sure that I should, if I can recall my feelings and beliefs of so long ago, have held categorically that art was art, and photography was photography, but that they had nothing to do with each other. But if it had been possible that I could have known or dreamt that all worth saying was being said, I might have wished I had not squandered my seventeen dollars and a half. And that, as you all probably know, is the worst of feelings in this mortal life—wanting your money back!

But the gods be praised! I did not know. And I proceeded to get deeper and deeper into the bottomless pit of Photography.

As a matter of passing interest, and since these meetings are informal, the quarter-plate Bull's-Eye held together for about twenty-five years, and finally gave up its life, as a piece of photographic equipment, only when a girl cousin of my wife's borrowed it to take with her on a holiday trip and dropped it on the unsympathetic surface of a macadamised road. Even a new camera does not respond favourably to such treatment and what can one expect of a twenty-five year old? Its soul still lives on, for I extracted the lens from the wreckage and it was used successfully very recently in demonstrating the performance of a single uncorrected objective as compared with that of a modern anastigmat. My wife, who, as my fiancée, kept and used my Bull's-Eye during the four years or so that I was away during the last little dust-up in Europe, still thinks that it took the best pictures that either she or I have ever taken (or will take, perhaps, and she remains quite cold towards my present collection of eight or nine cameras, twenty-seven lenses, two enlargers and all the attendant paraphernalia. Among all

this assembly I have still kept, magpie-like, the "daylight" developing tank and box and the two small dishes!!

But I am wandering away from the subject about which all was said thirty-five years ago. Let us be thankful, fellow members of the Pictorial Group, that in any case, it is not so much *what* is said as the *way* in which it is said that will always make it worth the re-saying. And let us be thankful also that, in the same way, although everything worth picturing may I coin a word? has possibly been pictured long ago, we have indeed an inexhaustible fountain to draw from; for there will always be another and (who knows?) a newer and better way of presenting it. Here also it is not *what* we make a picture of; but *how* we make a picture that can be intensely interesting.

And how are we tending to treat our compositions? I submit to you the amazing suggestion that perhaps we are tending towards being too simple. I said that this is an amazing suggestion, because all my conscious life—I mean since I have been conscious that there might be an "art" side to photography—I have maintained, and I still maintain, in spite of the apparent contradiction, that our art can never become too simple—nor even simple enough. And now to get myself out of that tangle, if I can!

I think that the perfect composition—and I am, for the purpose of the argument, being platonic enough to assume the existence of the perfect composition—should be such an integral whole that the removal or elimination of any part would result in a loss. That may sound like a good flat platitude, but, with your pardon, I state it, as being necessary to the development of my thought. In that sense, I feel that a composition should be reduced to its barest simplicity—let us crystallise our thoughts about a composition for the moment into the balancing of tonal masses and the arrangement of the formal lines. Let this balancing and arrangement be of the simplest, but *within* this integral simplicity, conforming to it and enhancing it, let us not descend to mere emptiness, mere poverty and bleakness. I feel that we are tending on the whole to avoid difficulties rather than overcome them; to produce single-figure compositions and all-too-easy concentration of interest on a detail shown, close-up, as it were, because such compositions are easier than many figure pictures and many-plane perspectives.

I have been reading recently a biography of Leonardo da Vinci, and as I was reading I realised the im-

ment, the breadth, the spaciousness of those days of the Quattrocento. I am sure that Leonardo had the quality of mind which would have delighted in the mathematics of the lens, the physical properties of gelatins, gums, pigments and oils; in the various complexities of colour and its rendering—in fact, he would have plunged himself deep into all the attractions of photography and still would have been able to apply them to great and masterly compositions.

Leonardo, according to Vasari, "lingered four years over his portrait of the Mona Lisa, and then left it unfinished." His activities over the great equestrian statue of Francesco Sforza were spread over sixteen years, and it never got past the clay stage. But it was his great picture of the Battle of Anghiari that came most forcibly to my mind in thinking about this matter of simplicity in composition—rather should I say, what was to have been Leonardo's great picture of the Battle of Anghiari; for it, also, was never finished. Difficulties were tackled with respect to the ways of preparing the colours and media for the fresco painting; but the studies for it and the cartoons of it remain for us to marvel at, especially when we consider them in the light of his own words, in his treatise on painting, on "How to represent a battle": "Show first," he wrote, "the smoke of artillery mingled with the dust in the air stirred up by the movement of the horses and the combatants. Then he considers the visibility of the combatants as seen through the haze thus created, the air also being full of arrows and trains of smoke, following the course of the balls shot from the guns. In his notes concerning the composition, he emphasised the passion of combat, the agony of death, the awfulness of the mutilation and the destruction of what is fair in life and nature. His effects are to be cumulative; the faces of the combatants delineated relentlessly; the concentrated fury of the conquerors intent only to slay; the conquered pallid, with brows knit, "the skin above the brows filled," he says "with lines of pain"—I cannot read it all. But note the wealth of detail, the richness of thought and feeling for action and for life—all these he incorporated into his studies. But his composition, as whole, remains simple and complete.

I have gone to some length to make my point, and to say that as I turned over the pages of an excellent publication—the second in the "Classics of Photography" series, edited by Kraszna-Krausz, *Victorian Photo-*

graphy, I saw again that we are the inheritors of a kingdom of precious tradition, but that we must not be afraid to develop that tradition—if necessary to break with it—if we are to be worthy of it. We can be at the threshold of a new departure for new adventures in pictorialism if we do not make the mistake of keeping on doing the *easy* things, the mistake of being simple merely because it is easy.

Therefore I am putting in a plea for less simplicity in our compositions with a hope that I may have succeeded in awakening in you, as I talked, some note of feeling attuned to my own; and perhaps also aroused your determination to revive some old thought worthy of presentation, even at the expenditure of considerable artistic labour and trouble, from some almost forgotten corner of your minds where it has lain buried for want of the will to give it expression.

The CHAIRMAN congratulated Mr. Scott Bushe on a scholarly presentation of his facts. He agreed that the tendency had been to simplify composition, possibly more in the sense of concentration than actual simplification. Whether it was inherited from the tradition of painting or not he could not say, but although the modern mind had become more complex, and our outlook on life more complicated, it seemed that in art there had been a tendency to return to simpler schemes and a simpler concentration of subject.

Mr. MORTIMER said there were some points arising from Mr. Scott Bushe's remarks that called for comment. One was the reference to a lecture given thirty-five years ago by Mr. George Bernard Shaw, who was alleged to have said all there was to say about pictorial photography, but Mr. Scott Bushe had made it clear that although Mr. Shaw's remarks on that occasion were admittedly brilliant and valuable, they had not affected his own point of views on the subject. This was something that should be borne in mind by every enthusiast in photography; never mind what the other man said or what his interests in the subject were—always go ahead and use one's own ideas, ideals and methods if originality was to be developed and success achieved.

Mr. MORTIMER was inclined to think that the complexity of modern life had not particularly affected the products of pictorial art, which, on the contrary, had tended to become more simple in character. Since the period of Mr. Shaw's lecture, pictorial photography had passed through a number of phases, each in its turn professing finality. There had

been, for instance, the period soft-focus work was the fashion; Bromoil and control process the field, but more recently tendency had been towards a photography and the glorification of close-up detail on a large engendered possibly by the mic camera. This was a form of simulation, but it was a phase that passed, as the others had passed, time, pictorial photography returned to the main stream of art again devote its genius to the portrayal of "big" subjects, but greater technical perfection, in the photographic process was properly exploited. People were tired of views of keyholes and baggages and similar subjects, main objective for a picture. I am glad to note that more large work was being done, as this period in recent years, had tended to disappear from the exhibition same applied to architectural. This was all to the good, partly as the tendency was to present subjects in a more simplified manner than was the case when the dealt with in the past.

Mr. MORTIMER's attitude, appreciative of every phase of photography as it arose, continued that of the "old stager" who worked hard in the past with camera to learn his photography produce pictures as the result of fully thought-out ideas. In the days one learned more about photography and picture-making by means than seemed possible amateur of to-day, equipped modern small camera. The ease with which one could expose a greater number of films in a short time in a miniature camera had a fascination all its own, but one lost many things in doing so. He was delighted to have heard Mr. Scott Bushe's remarks, and thoroughly agreed the points of view he had expressed so well.

Mr. JAMES said it seemed that possibly they were confused by the simplicity of the subject and the simplicity of the composition thought Mr. Scott Bushe was on simplicity of composition, but had been discussing simplicity of subject, and undoubtedly there had been a greater tendency towards simplification of the subject. When it came to simplification of composition he doubted whether it could get beyond simple composition and succeed. It was the simplicity of composition, getting down to essentials, which would tell in the way one wished to tell the composition were more elaborate than it need be they would do

ower as artists. Whether they agreed that photographers were artists or not, there must be some artistry in photography, otherwise there would not be a pictorial group. When two people—one who knew something about photography and one who did not—took the same subject, the practical worker would achieve something better.

When one came to Michael Angelo and the other old masters, who achieved great pictures, he did not think they got beyond simple composition. The mere fact that they had huge canvasses and the ceilings and walls of buildings on which to put their paintings, did not influence their composition, which must always have remained simple. The story must be told in the best and most effective manner. In literature, all the best authors had been the simple narrators, and the same applied to picture making.

Personally, he had a leaning towards simplicity of subject as well as of composition, because he thought photography favoured it, but even then he did not restrict himself in any way. If he were attracted by it and thought himself able to deal with a broad and extensive landscape, he would try to do so, but he did not think he would succeed because he did not see that particular type of beauty; he did find beauty in small things. But with any subject, the only effective composition was the simplest which one could evolve.

Mr. SCOTT BUSHE said that all the time he was thinking round this subject he was conscious of the fact that he was skating close to the edge of the subject matter rather than composition. He quite agreed with Mr. James; in reality, no matter how grand or complicated the subject, the composition should be kept simple.

Mr. GRATTAN asked if Mr. Scott Bushe was missing evidence of serious composition; when he talked of more elaborate composition, the speaker thought he would be satisfied could he see more evidence of composition. They were in a position at the moment when anything startling, anything which made one look, which shouted from the wall, was first-class photography. He would state categorically that very few photographers knew what composition meant. They got something from their roll of thirty-six negatives and said that one was good enough for exhibition—and it got accepted, too! That man had not the desire nor the facilities for discovering anything to take the place of that sort of pictorialism, and that was one of the things against which they had to guard. It had come with the advent of the manufacturer. He put it forward seriously that what Mr. Scott Bushe meant was: "For goodness sake let us see some composition, simple or complicated."

Mr. SCOTT BUSHE agreed. What he did mean was, as Mr. Mortimer had said, that there was a phase for sim-

plification of the subject to the extent of making a picture out of detail. They must try to get out of the phase and to make a conscious effort to do so.

Mr. LEEDHAM said that it was the way in which subject matter was selected and presented by different persons which made photography worth while, and that was its attraction to him. What it seemed was happening now was that most people were getting a little more common sense into the way of presenting pictures, and to make them more understandable they used a minimum of material. As they varied their methods they applied different methods of working, different focussing, different sizes, different materials, and it was only when they got as far as that that they would say "this is composition." If one obtained a good picture and liked it and other people liked it, one could say it was good composition. If composition was to be measured with a slide rule one might as well give it up.

Mr. SCOTT BUSHE said he felt a grain of disagreement with the last speaker, in that the best exponents of composition, the old painters, did hack it out with a slide rule.

Vote of Thanks

The CHAIRMAN proposed a hearty vote of thanks to the opener of the discussion, saying he hoped they would have further similar discussions.

THE NEW HOME PORTRAITURE*

Portraiture as a subject attracts many photographic writers. The section of the R.P.S. Library devoted to this phase of the art is by no means small, yet among the volumes there are not many of practical use to the man who has neither studio nor special lighting equipment. Mr. Henry G. Russell, A.R.P.S., better known as "Minicam," has remedied the deficiency in the present volume by combining within two covers treatment of the three essentials of successful home portraiture: how to understand your sitter and to place him or her at ease; how to light your sitter, and how to expose, develop and print the resulting negative. Most writers in their anxiety to deal with the technique of photography overlook the vital psychological side of the subject—hence the self-conscious, wooden expression seen in so many examples of home portraiture. It is no small virtue of this book that the writer fully realises and discusses the importance of approach

and many professionals might take to heart his advice in this connection.

To remedy the average photographer's lack of special lighting equipment the author has designed simple inexpensive home-made apparatus, including two spotlights, full constructional details and diagrams of which are provided. He relies largely upon the popular photo-flood bulb as a source of illumination, and in order to lengthen the effective life of these handy and cheap lamps, describes a simple dimmer which can be made by any handyman. Exposure being an important factor in successful portraiture, this aspect is very fully treated, and the more modern methods of using the photo-electric meter are adequately discussed.

As most readers are likely to confine their work to a single camera with only one lens, special attention is devoted to the choice of the best

portion of the negative to enlarge, and some instructive illustrations are given to show how drastic trimming can produce a striking and characteristic portrait from what might otherwise be a mediocre snapshot. Outdoor portraiture is not forgotten and the final section, entitled "In the Darkroom," brings together a great deal of useful information on developing, printing and finishing the picture.

A special word of praise must be given to the typography, layout and illustration of this volume. They have a brightness and modernity which we have come to associate more with American than British technical books. "Home Portraiture" printed throughout on art paper, measures 7½ in. × 5 in. and has 136 pages. Although in appearance a small volume, there is no padding and it is packed with useful information. This book should receive a wide welcome amongst those photographers to whom a camera is something more than a notebook. P.W.11.

*"The New Home Portraiture," by Henry G. Russell, A.R.P.S. London: The Pountain Press. 10s. 6d. net.



1. Moving granules in apical vac. of *Clasterium*. $\times 1950$

THE PHOTOMICROGRAPHY OF LIVING SPECIMENS

By K. D. Froome, B.Sc., A.Inst.P., F.R.M.S., and B. A. Jarrett, B.Sc., F.R.M.S.

THE photomicrography of living organisms is a subject which presents to the photographer many difficulties not encountered in the photography of motionless or mounted specimens. Nevertheless, it is a fascinating science, and the only way in which the objects in question can be portrayed exactly as they appear to the observer, for all drawings, however good, reflect the artist's mind, and no photograph of a dead or mounted specimen (except diatoms) conveys the appearance of a living one. As well as for naturalists, it is also of particular value to those workers who wish to show one specimen in various stages of its formation, e.g., abnormal cells caused by blastogenic agents, where there may be only one specimen available.

During the past few years, the authors have been developing a technique for the instantaneous photomicrography of living and often rapidly moving microscopic pond life. In compiling a photographic record of local pond life, we have found it necessary to visit many ponds, as there is not usually an abundance of more than one or two species in any one pond. We found that the usual type of microcamera was unsatisfactory for this work.

The conventional method of photomicrography suffers from a number of serious drawbacks. The first is that it is usual to use an exposure time of several seconds, whereas for the photography of a moving object, especially, say, *Paramecium*, the

exposure time must be of the order of 1/50 sec. The obvious solution of using a very powerful illuminant (e.g., an arc lamp) is unsatisfactory, since too powerful a light is liable to kill the specimen, or, more often, to greatly increase its rate of motion, thus rendering it almost impossible to photograph. Most organisms are photonegative, and swim violently away from a bright light.* The second difficulty is that of focussing. The specimen is usually constantly moving in and out of the focal plane of the objective—in other words, it is necessary to use a camera with an additional eyepiece, so that the specimen can be kept under observation and in focus, up to the instant of exposure. Thirdly, the normal shutter is hand operated. This is a serious disadvantage, in that one hand is needed for focussing and the other for keeping the specimen in the field. A foot-operated shutter is, therefore, more desirable. Fourthly, a fluid is very sensitive to the slightest mechanical vibration. Standard shutters, such as Compur and roller blind, were found to blur high-power photographs, due to vibrations, whether situated in a camera fitting over the eyepiece of the microscope, or supported on a separate stand, but on the same table. We therefore designed a camera to be free from these disadvantages.

Fast cine film is used to overcome the exposure time difficulty, as the illuminated area is much smaller and

the illumination thus more intense. It is very economical, which is valuable since many photographs of a specimen must often be taken to make the resolving power of cine film such that an enlargement of five diameters is necessary to show all the detail conveniently.

The shutter is electrically operated by a timer placed on the floor, released by foot. The shutter acts as a mirror, while it is reflecting the rays from the microscope eyepiece into a viewfinder in the camera. It consists of a thin blackened pivoted spring sector to the underside of which is cemented (with a cement of the same refractive index as the glass) an optically flat piece of glass 1/100th inch thick. The outer surface of this reflects into the viewfinder about ten per cent of the incident light, which for our purposes gives a visual image of comfortable brightness, since a fairly powerful illuminant is used. To the sector is attached an arc of soft iron, which in an arcuate solenoid. When current flows in the solenoid, the iron plunger is drawn in, opening the shutter. The shutter closes on the action of hair-spring when the current ceases. On the fastest exposure ever, the nature of the stop action is a much more important factor in closing it quickly. (This is together with details of the timer described, would make this too long if considered fully here

* Duggar, "Biological effects of Radiation."

ter is inclined at 52° to the horizontal, and reflects light into a view-eyepiece at 14° to the horizontal. It weighs only 1½ grammes, and the outer tip of the sector moves e-eighths of an inch. Hence it is much more free from vibration than ordinary mechanical shutter of various parts. The camera body is supported over the microscope on a separate tripod stand.

The duration of the electrical pulse conveyed to the solenoid determines the exposure time. Hence to obtain an exposure it is only necessary to cause a current to flow in this for the required time, assuming time of opening and closing to be negligible compared with this. This pulse is produced by the timer on floor.

The timer is mechanically operated. It is not vibrationless, but it has been found that no sensible vibration is communicated from the floor to the eyepiece of the microscope. It consists of a stepped sector of conducting material driven round at a constant rate under a brush moveable in radial direction. When a segment comes under the brush, an electrical pulse depending on the length of the segment is conveyed to the shutter by a dry battery. The length of the pulse can be varied from 1 second to

1/250th sec. On 1/250th sec. the shutter gives an exposure of 1/200th sec. This gives a very slight gradation across the film. On all other speeds the exposure is even across the film.

This camera is very simple to operate, and we have obtained successful results over a large range of pond life subjects. In general, a ½ in. or ¾ in. objective, and a 15× eyepiece has proved efficacious, for the larger invertebrata, such as Rotifers, since the required depth of field is obtained. The illuminant is a 24-watt car headlamp with condenser, and with panchromatic cine film of speed 32° Sch., exposures can be obtained of 1/200th sec. up to 500 diameters (when enlarged 5×). Exposures up to 3,000× can be obtained in 1/50th sec., using an oil immersion objective.

A contrasting bromide paper is needed for making the enlargements, as the negatives usually lack contrast owing to the transparent nature of the specimens.

It is found that a mechanical stage is most suitable for chasing rapidly moving specimens. The specimens are mounted by placing a drop of water containing a little of the organic material they inhabit on a clean slide, and dropping a cover slide on it. This is lightly pressed down until the water fills the area under the slip.

The small pieces of organic material act as spacers, preventing the organisms from being damaged. For transparent objects, such as Rotifers, the objective has to be fairly severely stopped down. Diffraction rings must be avoided. Filters are seldom used owing to the exposure increase they necessitate. Of the photographs shown, that of *Closterium* is outstanding, in that a vibration of one quarter the wavelength of sodium light would have appreciably blurred the granules.

This paper is intended to show how special apparatus is needed for the photomicrography of living organisms. It is hoped that those photographers interested will be able to obtain information from it.

Details of Photographs

1. Moving granules in apical vac. of *Closterium*. 1,950×. Objective 1/12th in. Oil. Imm. N.A. 1.3. Eyepiece 15×. Exposure 1/50 sec. Film: Kodak Super XX.
2. *Vaginicola* 750×. Objective 1/8th in. N.A. 0.85. Eyepiece 15×. Exposure 1/50th sec. Film: Super XX.
3. *Brachionus Bakeri* 187.5×. Objective 2/3 in. N.A. 0.28. Eyepiece 15×. Exposure 1/200th sec. Film: Super XX.



2. *Vaginicola*. ×750



3. *Brachionus Bakeri*. ×187.5

OBITUARIES

It is with deep regret that we have to record the death of two prominent photographic personalities, both of them Honorary Fellows and Progress Medallists of the Society.

Mr. Arthur S. Newman died on August 12th; Mr. Frank Forster Renwick two days later. Both had served the Society nobly and were devoted to its welfare.

ARTHUR S. NEWMAN

The passing of Arthur S. Newman in his 83rd year creates a further gap in the fast-thinning ranks of those pioneer workers who devoted their engineering skill to smoothing out the numerous problems that beset the earlier makers and users of cinematographic equipment—Mason, Prestwich, Pathé, Paul, Moy, Vinten—our old friend had known most of them and they were at one in appreciating his flair for design. When he, at that time a scientific instrument maker, turned his inventive genius to the moving picture this last was little more than a money maker for showmen who, in fair booths and "penny gaffs," cashed in on the sheer novelty and wonder of projected images that counterfeited life. It did not seem to matter if the said images wobbled and jerked distractingly, they moved and that sufficed. (Mercifully, perhaps, manufacturing difficulties kept their average length well under a hundred feet.)

The modern cinema mainly owes its smoothly running, almost flickerless pictures to an extreme accuracy (reckoned to the one ten-thousandth part of an inch) in the dimensions and spacing-apart of the film perforations. For the Heath Robinson contraptions that at first punched these necessary holes—with unforgettable results—Newman substituted a die linked with a dowel-pin or guide that entered each hole as made and held the film in place for the next punching operation. If one seems to lay overmuch stress on this particular invention it is because in many conversations with the writer, "A.S.N." used himself to count this tiny but important device among his major achievements; one which, in fact, reappeared in a modified form to contribute an admirable steadiness to the Newman-Sinclair Auto-Kine Camera, of which more anon.

The teething troubles of the cinematograph, as Newman realised, were principally due to the loose, rule-of-thumb methods which pre-



Arthur S. Newman

vailed, and he entered upon an uphill fight for standardisation in the industry, contributing to the *Bioscope* of that period a series of articles which were models of clear thinking. The arrival later of the talking film, with its added complications, lent force to the issue. International conferences at Paris and elsewhere, at which Newman was a prominent figure, debated the subject at length and a large measure of agreement was finally reached. The elaborate self-threading N. and S. cine camera, with which the historic Mount Everest Expedition films were taken, had been in successful use for some years when its designer became persuaded of the need for a spring-driven hand model which would take (without the frequent halts for rewinding necessary in all similar apparatus then available) scenes of considerable length. The task involved serious problems of balance and design, but the first model of the "Auto-Kine," lent me for exhaustive test at Elstree Studios about 1927, ran for 150 feet with no appreciable drop in

speed. Various refinements, out of an uncanny knowledge of what springs could be made brought this non-stop run to 200 feet, the content of a full zine, and this with a steadiness has permitted employment in most crucial of tests—back projection. To naturalists, explorers, and, of course, the fighting services, proved invaluable, bringing to screen much material difficult not impossible, of attainment wise.

The substandard film and much of Newman's attention and models exist of both camera and projector, each displaying the same originality of design and grasp of essential needs, and discerning which more may be later.

Relatively few are aware of Newman's interest in the microscope. He was severely critical of the conventional design of this instrument, albeit hallowed by generations of users, and so evolved a model, lines of the optical bench, with piece, objective, and substage mounted directly in line and centrally centred instead of being distributed about a hump-shaped work, and each requiring, on account, individual adjustment. The model, when demonstrated at the Royal Microscopical Society, of which he was a Fellow, evoked the warmest praise, but he was warned that in few scientific fields was progress so strong, and that fifty years elapse before his revolutionary became generally accepted!

Although Newman's name is popularly associated with the cinematograph his versatile mind was equally at home in other photographic activities. As part of the firm of Newman and G. he designed the well-known "Hand camera" and many will remember the Newman Multispeed S which for a long while kept its lead among things of its type. His later, and more formal association with that sterling generous friend, James Sinclair, was responsible for the "much in vogue among serious photographers on travel bent, to wit ultra-rigid tripods and accessories. A reputation for sourcefulness made it inevitable that his experience should be drawn by large undertakings here and abroad. George Eastman gave him a royal welcome to Roches Pathé of France sought his help in planning their motor-driven "Kine" He held important office with the Kinematograph Manufacturers' Association, helped to found

the Kinematograph Society and in the British Board of Film Standards. A frequent and valued speaker at our Society's meetings, he sat on the Council for many years and was several times Vice-President. When the Kinematograph Section was formed he was the natural choice as Chairman and in that capacity continuously active. The Progress Medal rewarded his inventions and researches in 1936, and, three years later, the Honorary Fellowship commended the Society's tribute to his long zeal in its service. Always a frail of body, Newman spent most of his leisure in the comfort of his home where, after the evening meal, the dining table would be covered with the odds and ends of his latest invention. Here he would sit and handle lovingly the things he was fashioning, his deft hands busy with file or reamer as he made small adjustments to this or that recalcitrant piece. Here, too, he would receive his cronies on Saturday evenings. One after another they would drop in. Mills, the agent for over forty years, the Gresham family (musicians all), the Ponting, back from some adventurous journey, Charles Robinson, the other of Heath Robinson and the artist, whose delicate drawings gave life to the fairy tales of Milne and others less well known. I joined the circle twenty years ago and rarely failed to be present when in England. We gathered round our host the more he demonstrated his latest invention or amused us with some experience or curious happening. Most of these habits have faded now, or removed from us, and of late only one or two could arrive, to find an ageing Newman in his accustomed place, still still bravely humorous. The verdict on a man is framed by his subordinates: Newman had gathered round him a band of trustworthy men. Some of them, like the father and sons, had been in the firm for many years, and their affection for "the little man," as they affectionately called him, was based on respect for his knowledge, and on the pleasure he gave in the teaching he ungrudgingly gave. Never was anyone to pass on the experience of a lifetime, and he delighted in coaching promising youngsters in the ways of his calling. Of the last days there is little to tell—lay at last in his beloved bed, so long overdue as to be a benefit—a sudden collapse—return to London for specialist treatment now unavailing—and the

end a day or two later, in merciful unconsciousness. Among the many assembled at Hendon Crematorium for the last tribute stood notable figures in the scientific world and representatives of the numerous activities of which he had so long been an ornament. The heartfelt sympathy of all goes out to Mrs. Newman, faithful comrade in struggle and triumph alike through nearly half a century.

ARTHUR PEREIRA.

A Personal Tribute

Mr. D. C. Gresham, F.R.P.S., writes from 33, The Ridgway, Finchley, N.3:

"As one of the younger members of the Society I feel I cannot let the occasion of the death of Mr. Newman pass without paying some tribute to his memory. Much will be written, by men more qualified than I, of his

genius and great pioneering spirit, which qualities will assure him of his niche in photographic history.

For my part I shall chiefly remember him for his great kindness, and I shall never forget the encouragement and help he gave me when I first joined the Society at the age of eighteen. Later my younger brother became Mr. Newman's pupil and personal assistant up to the time of joining the R.A.F., in which service he was later killed.

Mr. Newman, at great personal inconvenience, attended the funeral service, and afterwards told me that he had counted my brother among his greatest friends.

I felt then as I feel now that no young airman of nineteen could have asked a greater honour, for, as I am sure all who knew him will agree, Arthur Newman was a true English Gentleman."

FRANK FORSTER RENWICK

Mr. F. F. Renwick, Research Director of Ilford, Limited, who died on the 14th August after a brief illness, was an outstanding figure in contemporary photographic science. He was sixty-six. His association with the photographic industry in this country reached back to the turn of the century (he joined Ilford, Limited as a chemist in 1898), and during the forty-five years which followed he made many important contributions to his subject. Blessed with a versatile mind and an exceptionally retentive memory, he was able to turn the experience of those years to such account that at the time of his sudden death he was at the height of his powers: it was, indeed, during his last few years that he brought into being two of the most remarkable photographic products of the century ("Multigrade" and "Kryptoscreen").

From the earliest days his work brought him closely into touch with The Royal Photographic Society, before which he read many papers and took part in many discussions. He was ever jealous to preserve the Society's pre-eminent position in photographic science and did much, directly and indirectly, to build up that position. For example, he was largely responsible in 1920 for the creation of the Society's Scientific and Technical Group. Naturally enough he became President of the Society (1927-1929), and here his capacity for clear thinking and his administrative ability still further increased the Society's debt to him.

That same administrative capacity



Frank Forster Renwick

stood him in good stead when, about the same period, the amalgamation of Ilford, Limited, with many other British photographic firms was taking place. To him was entrusted the difficult task of co-ordinating the laboratory staffs and services of the companies concerned, and this he did with such effect as to build a substantial research organisation on the foundations which he had helped to lay in the earlier years of the century. In this he was no doubt aided by experience gained during a brief interlude in the United States in 1922-1925, when he directed the

Redpath Laboratory of the DuPont Film Manufacturing Corporation at Parlin, New Jersey.

His outstanding integrity and devotion to his chosen work were obvious to all who knew him. Retiring by nature, and self-conscious even to a fault, he was, none the less, ready to champion a cause in which he believed; and it was this dogged devotion to principle that won him some of what he would have regarded as his greatest successes. Undoubtedly, too, it led to his remaining at work till the last possible moment, which was within three weeks of his death.

He became F.I.C. in 1918, Hon. F.R.P.S. in 1922 and F.C.G.I. in 1930. He gave the Traill Taylor Memorial Lecture in 1911, and in 1921 he was awarded the Progress Medal of The Royal Photographic Society. In 1936 he gave the Hurter and Driffield Memorial Lecture, and in 1938 he was awarded the Péligré Medal of the Société Française de Photographie in recognition of his services to photographic science.

He was a Fellow of the Physical Society and for many years a Fellow of the Chemical Society. He was also a Member of the Faraday Society and of the Optical Society of America and of the Society of Motion Picture Engineers.

He leaves a widow, and four children of his former marriage—two sons, now in the Middle East, and two married daughters.

Scientific Work

This is not the time or place for a detailed appraisal of Renwick's scientific work, but in a brief review we may distinguish at least three recurrent themes. The first of these, photographic sensitometry and tone reproduction, with its fundamental problem of the significance and the measurement of photographic density, was to develop stage by stage throughout his working life. His early experimental researches on the absorption of light by scattering media, carried out at first alone and later with the co-operation of the late B. V. Storr and of O. F. Bloch (still happily with us), were marked by a care in execution and a degree of insight which cannot but excite our admiration when we remember the difficulties which, thirty years ago, attended the study of a subject still complex at the present day. Arising from that work he made, with W. B. Ferguson and D. E. Benson, the "F.R.B. Densitometer" which was to serve for many years as a primary standard for density measurement. Armed with this instrument, he turned his attention to the broader

question of photographic tone reproduction. This led him naturally to consider the desirable sensitometric properties of photographic papers and to examine the stepped relationship which should subsist between the successive members of a family of papers of different contrasts. The fruits of this work are to be seen in present-day efforts to standardize the specification of paper contrast, and in the remarkable product, "Multigrade" paper—a paper of controllable contrast, for the introduction of which he was responsible little more than three years ago.

Next we should mention his contributions to the theory of the photographic latent image. In 1920 he advanced the view that the action of light is to coagulate minute particles of silver present in the sensitive grains of an emulsion, so as to form a centre large enough to act as a nucleus for development. While the modern theory of solids, in the hands of Gurney and Mott, has given us a more detailed and somewhat different picture of exactly what happens, there are points of similarity between the two theories.

Renwick's third theme, which dates from the second decade of the century, was his quest for a photographic material which, by containing fluorescent substances, would have a greatly enhanced sensitivity

to X-rays. Ordinary photographic emulsions are sensitive to X-rays, but absorb very little of the radiation and allow by far the greater part to pass through unused. Renwick's efforts were crowned with success after a prolonged study of X-ray fluorescence, when he discovered and put to use the remarkably powerful fluorescence, under X-rays, of complexes of lead sulphate and barium sulphate. These complexes are used to form very efficient and relatively cheap X-ray intensifying media in "Kryptoscreen" paper and "Bryter" intensifying leaves.

Renwick was educated at the City of London School and the Central Technical College of the City and Guilds of London Institute, where he studied under H. E. Armstrong in 1893-1896. Becoming A.C.G.I. in 1896, he was awarded an Institute Scholarship and the Leathersellers' Research Fellowship which he held for a year. With this chemical background to his photographic work, he became thoroughly familiar with sensitizers and with the complexities of the modern photographic emulsion; but all the more remarkable was his clear insight into some of the attendant physical problems. The combination gave him a rare understanding in discussion which will be sorely missed.

L. V. CHILTON.

GEORGE ALBERT FORMAN

It is with deep regret that the death of Mr. G. A. Forman, A.R.P.S., is also recorded. This took place at his home, "Wensley," Bleak Hill Road, St. Helens, Lancashire, on July 30th last. Aged 60, Forman's was a lovable personality, and his legion of friends will miss him acutely. As a judge and critic in photographic circles he was ideal, for everything he said or wrote was delightfully phrased and tinged with kindly humour.

Joining The Royal Photographic Society in 1928 he was admitted to the Associateship in 1931. President of St. Helens Camera Club on two occasions, he was also secretary for 17 years. He was a member, too, of St. Helens Art Club. The Lancashire and Cheshire Photographic Union for a number of years had him as an active worker. Secretary from 1930 to 1932, he was then made president, then auditor, and from 1937 to the time of his death held the position of treasurer. He was also on the list of judges and was one of the lecturers. At the time of his death he was engaged on judging this year's lantern slide com-

petition. In passing, it might be said that he wrote the critical commentary on the lantern slides selected from last year's R.P.S. Exhibition and which are now circulating photographic societies by virtue of the Photographic Alliance.

Mr. Forman had long been an exhibitor, though perhaps not so much in recent years, but his work was seen and enjoyed by many members of portfolios, notably Circle 2 of the A.R.P.S. Postal Portfolios, the Amateur Postal Camera Club (lantern slide section), the Lantern Slide Postal Club and the Postal Photographic Club.

During the present war his energies led him to undertake the post of head warden in a part of Whiston rural area, and he was a committee member of Eccleston Village War Comforts Fund, and the Eccleston War Savings and St. Helens War Savings Association.

Mr. Forman leaves a widow, Mrs. B. Forman, who, too, was at one period president of St. Helens Camera Club, and to whom heartfelt sympathy is tendered in her bereavement.

J. S. WARING.

THE TOPICS OF INTEREST FROM VARIOUS QUARTERS

THE R.P.S. ANNUAL EXHIBITION

The 88th Annual Exhibition of The Royal Photographic Society opened at 16, Prince's Gate, on September 3rd, by His Majesty King George VI and Queen Elizabeth, and by His Majesty King Peter of Yugo-Slavia.

Report of the proceedings will appear in a subsequent issue.

The Exhibition is open on week-days from 10 a.m. to 5 p.m., and on Sundays, September 12th, September 26th and October 9th from 2 p.m. to 5 p.m.

A Sunday opening is introduced to afford Members and others an opportunity of war work or through other causes to travel on week-days an opportunity of seeing the Exhibition.

Features will be given during the Exhibition as follows:

Monday, September 25th, at 5 p.m. "North Africa." By G. B. Mason.

Tuesday, October 9th, at 5 p.m. Projection of 16 mm. Technicolor Travel Films. (1) "Jerusalem." (2) "Wanderers of the Desert." (3) "Arabian Bazaar." (By courtesy of Britannia Films.)

The Exhibition comprises Pictorial Photography, Colour Photography, Scientific and Technical Photography, Natural History Photography, Stereoscopic Photography, and Press, Theatrical, Commercial, Advertising and Record Photography.

MASS MINIATURE RADIOGRAPHY

Advantages to the community in instituting such a scheme as that of miniature radiography are so compelling that it is gratifying to learn that deliveries of the Ministry, for the carrying out of this type of the civilian population, are actually taking place, and it only looks as if it were only a question of time before full advantage will be taken of this comparatively inexpensive means of examination, in which photography plays so important a part, and becomes a contributory factor in assuring the health of the nation.

At the twenty-sixth Annual Conference of the National Association for the Prevention of Tuberculosis, in London on 28th July, Mr. Cranch, F.R.P.S., Radiographic Technician to the Welsh National Tubercular Association, read a paper "The Mass Radiography Scheme; Scheme of Mobility."

After referring to the progress of the scheme in Wales, Mr. Cranch concluded:

"What of the future? Two factors have considerable bearing on the scheme: (1) Within the last few years, photographic research workers and emulsion chemists, on whom success of the miniature radiography depends so largely, have produced much faster films; (2) The development of British-made lenses,

surface treated, with resulting increased transmission. Incidentally, the W.N.M.A. may perhaps claim the credit of being the first to approach Messrs. Taylor, Taylor & Hobson as to the possibility of the use of a coated lens for mass radiography, and, in fact, were actually the first to obtain one.

graph, and, in fact, were actually the first to obtain one.

"Such lenses, used in conjunction with the faster emulsions, have speeded up photography of the fluorescent screen to such an extent that even the half micro-farad condenser-discharge set now becomes a practical proposition. We have also to bear in mind the electrical advances already made, with promise of still greater developments in efficiency and portability of transformer design.

"In short, all these recent advances make possible the use of much smaller productive units of any type and solve to a great extent the difficulties of transportation and the necessity for large power-mains.

"At the moment, however, our concern lies with the Ministry of Health sets, which were designed before the most recent photographic advances, and are now in production, and of which deliveries are taking place. These sets, designed by the well-known firm of Messrs. Watson, are of a very high standard and capable of producing miniature radiographs of first-class quality. The problem of making these mobile may be solved in one of two ways:—

"(1) As suggested in the Advisory Report, i.e., by using a van with the necessary tackle for loading and unloading the unit and transporting it to a location where ample electric power is available; or, alternatively, using a separate generator.

"(2) By the use of large-sized van, such as that of the W.N.M.A., with



For viewing, the miniature films are projected on to a screen of 6x6 inches. An illustration from the exhibit arranged by Ilford, Ltd., in the R.P.S. Annual Exhibition, demonstrating mass miniature radiography

the unit installed and the van used as the X-ray room, thus avoiding the problems of loading and unloading the equipment, erection and dismantling of plant, appropriation of a suitable room for X-ray work, and possible damage.

"It should be realised that the van body, being 22ft. by 7ft., readily allows a continual flow of examinees and can quite well cope with a number of 100 per hour; the unit is ready for operation soon after arrival, and, as in the case of (1) can be used with suitable electric power where available, or, alternatively, with a separate generating set.

"During war-time the Welsh National Memorial Association propose to arrange for the use at the factory, works or school of two rooms as assembly and dressing rooms, the latter being fitted with light portable cubicles. The van would be drawn up close to a suitable entrance and, where necessary, a short portable covered way, from entrance to van, would be provided.

"The Welsh National Memorial Association van was designed essentially for our own methods, but now that the Ministry set is available, we propose, with modifications, to utilise the van for housing that set, which will then be used as a mobile unit in the manner outlined. For the utmost efficiency the van should, of course, be specifically designed to meet the requirements of the Ministry units.

"In conclusion, I might mention, in case any authorities may decide to mobilise their set in this way, that quite recently I examined one of the International articulating trucks, and thought how suitable something on these lines would be as a base for a mobile van, providing, as it does, a flat floor space of approximately 24ft. by 7ft. 3ins. clear.

Added interest is given to Mr. Cranch's review by the exhibit in the R.P.S. Annual Exhibition staged by Messrs. Hford, Ltd., demonstrating Miniature Mass Radiography.

Art and the Film

The following leading article under the above title appeared recently in *The Times* :

The cinema, because of the immense influence it wields, needs every now and again to be reminded of the standards that apply to the older arts that are allied to it. Ruskin's definition of art as the language of the imagination serves well when it comes to judging the quality of films, but the correspondent who quotes it in a letter recently published in these columns was, perhaps, doing the cinema an unconscious disservice by

his insistence that the films are already masters of it. It is precisely on this point that those who love the cinema this side idolatry part company with those who topple over on to the other. "A language in which the best film directors, actors, and technicians of Britain, America, France and Russia are often exquisitely fluent," writes Mr. Nicolas Bentley, and the pleasing picture the phrase conjures up is one of the screen filling with film after film conceived, shot, and cut in conformity with the highest aesthetic principles. Whereas the truth is that "The Magnificent Ambersons"—which it was not decided until the last moment to show in the West End of London at all—by catching accents of the language Ruskin had in mind, seemed to come from a world altogether different from that in which the normal run of films spin out their unremarkable lives.

The standard of technical performance in the cinema is high, its influence more healthy and beneficent than it is the fashion to suppose, and it is no mere superior attitude of mind which deplores the dread of the saving quality of imagination in which the commercial cinema would seem to stand. Everything must be put down in black and white (or technicolor), every loose thread gathered up, every point rammed home lest the over-pampered audience find itself compelled to play its proper part of establishing an actively conscious contact with the screen and helping with the creation of a work of art. This is not, of course, to deny that the cinema has created works of art. The Russians have shown themselves masters in the cinematic medium; they use the screen as a painter uses his canvas, and compose, rather than make, their films. The French cinema, too, had charm, cohesion, and character, although, even here, there was before the war a tendency to exaggerate and over-praise—even so agreeable a trifle as "Sous les Toits de Paris" would not, translated into terms of literature, rank higher or lower than, say, a *conte* by Ronald Firbank. Britain and America, however, for all the good and wholesome work they have behind them, have not been so prolific of masterpieces, and, although it may be urged that the history of the cinema is short, it is a history crammed with riches and opportunity. It could have everything money could buy, and had everything publicity could do, and yet in spite, or perhaps because, of all its wealth of money and self-praise, the output of films which satisfy Ruskin's definition has remained

small, and Mr. Walt Disney and Mr. Orson Welles voyage on alone.

This war is such a vast and heroic thing that the films are certainly not to blame for failing to measure up to it, but their efforts to do so—documentaries, news-reels, and productions made by service units apart—have so far not been impressive. Tribute has been paid in these columns before now to the improved quality of British films; "In Which We Serve" was a most movingly phrased piece of dramatic reporting, and "One of Our Aircraft is Missing" something more than the best of the many films made about the occupied countries, but from the other side of the Atlantic up to now nothing of real importance has come. That it will come there is no doubt—we have been at war longer than America; that the cinema, in general, will grow in invention and integrity there is no doubt; but the dangers lest the language of megalomania in which the films habitually talk about themselves should hypnotize others into confusing promise and performance. The cinema is, beyond question, a social phenomenon of vast and permanent importance; as yet it is an art only at few and unpredictable moments.

Portuguese Salon

The Seventh International Salon of Pictorial Photography is announced to be held in Lisbon in March and April, 1944.

In future, the Salon, which is organised by the Photographic Society of Portugal, will continue to be held annually in March and April, instead of in November and December, as in the past.

Only work of a definitely artistic character, well executed technically, will be accepted. Reproductions of photographs or drawings and hand-coloured photographs are excluded, as well as any works which may already have appeared in Portuguese Exhibitions.

Each exhibitor may present a maximum of *four prints*, each of which must bear on the reverse side, legibly written, the name and exact address of the Exhibitor, title, number, and the process employed. On the front of the print only the signature of the author is allowed.

Any size will be accepted, from a minimum of 18×24 cm. and a maximum of 30×40 cm. The outside size, including margin, must not be more than 38×48 cm., and in no case should prints be mounted on cards. No exhibits will be accepted which do not comply with these conditions.

All prints accepted will be mounted in cut-out overlay mounts for ex-

m. These mounts belong to the F. and will not in any way pre-
the prints.

entry fee is U.S.A. \$1.00 (or
alent) in cheque to the order of
remio Portugues de Fotografia.
correspondence and parcels
l be addressed to the *Gremio
ques de Fotografia*, Largo do
o, 12, 2, Lisbon, Portugal.
test date for the acceptance of
entry fees, and delivery of
Form is fixed for 31st Decem-
1943.

prints accepted will be ex-
d in Lisbon, in March, and after
orto, in April.

h Exhibitor whose work is
ed will be presented with an
c diploma, but all, whether
entry be accepted or not, will
e a copy of the illustrated
gue.

cases not provided for by these
will be decided by the G. P. F.
ibitors who have difficulty in
ing the entry fee on account of
esent conditions, are asked to
on the entry form that they will
the fee so soon as circumstances
t.

S. A. Sinclair & Co., Ltd.
of the best known firms in the
graphic industry is that of
s. James A. Sinclair & Co., Ltd.,
Whitehall, London, S.W.1, and
e sure that readers will be in-
ed to know that this year it
ates the fortieth anniversary
establishment. It was founded
e late Mr. James A. Sinclair,
S., in 1903.

hose days carriages were more
on in the Haymarket, where
m commenced business at No.
an motor cars. This was a small
e-fronted shop with three stories
, and had previously been used
restaurant.

are indebted to Mr. C. W. Plank
ctor of the firm, for his remin-
es of these premises. "It
seemed to us," he said, "that
not been for the premises on
side the place would have
down even then, as the walls
loors were much out of the
al. However, it served our
se very well, and housed all the
ctivities of the firm. The upper
was the Developing, Printing
nlarging Department, and is
bered as being intolerably hot
nmer on account of the glass
ht above. The problem of deal-
ith Lumière Autochromes in
atmosphere can be well imag-
Even the roof itself was part of
orking premises, as it was used
ver printing. Subsequently, a
y was started for the manufac-

THE YEAR'S PHOTOGRAPHY

Special Notice to the Secretaries of the Affiliated Societies

"The Year's Photography" is
published annually in lieu of an
October issue of "The Photo-
graphic Journal."

The 1943-1944 edition, contain-
ing selections from the Pictorial,
Natural History and Record Sec-
tions of the R.P.S. 88th Annual
Exhibition, now on view at 16,
Prince's Gate, will be posted to
members in due course. The
contributors of the commen-
taries are Mr. F. J. Mortimer,
C.B.E., F.R.S.A., Hon. F.R.P.S.,
Mr. Oliver G. Pike, F.R.P.S.,
and Mr. G. E. W. Herbert,
F.R.P.S.

In the past this issue has been
made available to the members
of the Affiliated Societies at a
discount of 33½%, provided that
orders were received through the
Secretaries of the Societies.

It is a privilege that has been
much appreciated and it is de-
sired to maintain it. In view,
however, of the paper position,
considerably fewer copies even
than last year will be available
for this purpose.

This year it is not proposed,
therefore, to circularise the
Societies with the usual order
form. Will Secretaries please
note that this is the only notice
concerning the concession which
will be made.

Orders should be forwarded
without delay to the Secretary,
Royal Photographic Society, 16,
Prince's Gate, London, S.W.7.

Under the scheme the cost of a
copy of "The Year's Photo-
graphy" is 2s. 4d., plus postage.

Orders should reach the Secre-
tary, at the latest, by the 15th
October. If more copies are
ordered than can be supplied, the
copies available will be allocated
to the Societies on a rationed
basis.

ture of the "Una" and allied wooden-
bodied cameras and another entirely
separate establishment for develop-
ing and printing work."

In 1910, in association with Mr.
Arthur S. Newman, Hon. F.R.P.S.,
—whose recent death we regret
so much to record elsewhere in this
issue—the firm of Newman & Sin-
clair, Ltd., was launched to deal with
the manufacture of metal cameras,
photographic shutters, and, finally,
the Newman-Sinclair Auto Kine
Camera.

During the last war the Haymarket
premises, with some of the adjoining
buildings were scheduled for demoli-
tion, but it was not until 1925 that
the premises were pulled down. By
this time the Haymarket was chang-
ing its character, and in any case, the
accommodation had become in-
sufficient for the expansion of the
business, so a move was made to
No. 3, Whitehall (then known as
9-10, Charing Cross), where the flag
still flies, despite the difficulties
imposed by war-time conditions.

The numerous friends and well-
wishers of James A. Sinclair & Co.,
Ltd., will unite in congratulating it
upon the fortieth anniversary of its
establishment, and will hope that
when ten years hence it celebrates its
half-century, it will do so in much
happier circumstances.

Herefordshire Photographic Society

It will be remembered that the
Herefordshire Photographic Society
recently announced the inauguration
of two lectures to be delivered an-
nually in memory of the late Mr.
Alfred Watkins.

The first lecture was delivered by
Mr. F. J. Mortimer, C.B.E., Hon.
F.R.P.S., F.R.S.A., on July 22nd, his
subject being "Photography's Part
in the War."

The second lecture is to be given on
October 14th at the Hereford Town
Hall by Mr. D. McMaster, F.R.P.S.,
President of The Royal Photographic
Society. The subject of Mr. Mc-
Master's lecture is "The Next
Decade in Photography."

On the same occasion Mr. McMaster
will formally open the first Inter-
national Salon of Photography to be
organised by the Herefordshire
Photographic Society. The exhibi-
tion will be judged by Mr. Hugo van
Wadenoyen, F.R.P.S., and entry
forms may be obtained from the
Honorary Secretary, Mr. A. Royden
Willetts, A.R.P.S., 19, Widemarsh
Street, Hereford.

The entry fee is 4s., and the closing
day for receiving entries, September
25th.

The exhibition will remain open
from October 14th to October 30th.

New Premises' Special Fund

The following donations are grate-
fully acknowledged:—

	£	s.	d.
Amount previously ac- knowledged	113	06	17 8
J. Durward, Esq. (2nd donation)	2	2	0
Miss Kate Smith (5th donation)	10	0	
	£113	09	9 8

ANNOUNCEMENTS

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2 2s. 0d.; Group subscriptions, which became due for renewal on the same day, are as follows: Scientific and Technical Group, 7s. 6d.; Pictorial Group, 5s.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s.; Kinematograph Section, 5s.

Group subscriptions may be included with the Annual Subscriptions, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscriptions to the Society through their own Bank to The National City Bank of New York, in New York, or direct to The National City Bank of New York. Such subscriptions should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square Branch, London, account. Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to ask them to mention their names, addresses and status (Fellow, Associate, Member); and Members making the remittance direct to The National City Bank of New York are requested to give this information.

It is important to note that payment should be made

"For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the same time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

ANNUAL EXHIBITION ARRANGEMENTS

Saturday, September 25th. 5 p.m. Lantern Lecture. "North Africa." By G. B. Mason.

Saturday, October 9th. 5 p.m. Projection of 16 mm. Technicolor Travel Films. (1) "Jerusalem." (2) "Wanderers of the Desert." (3) "Arabian Bazaar." By courtesy of Britannia Films.

Saturday, October 23rd. Closing Day.

The Exhibition will be open on Weekdays from 10 a.m. to 5 p.m., and on Sunday, September 12th, Sunday, September 26th, and Sunday, October 10th, from 2 p.m. to 5 p.m.

LECTURE PROGRAMME

Tuesday, September 21st, 6 p.m. Meeting arranged by the Scientific and Technical Group. (1) "A Problem in Industrial High-Speed Photomicrography." By R. S. Allan, B.Sc., F.R.M.S. (2) Demonstration of Eastman High-Speed Camera, Type III.

Wednesday, September 29th. 7 p.m. Films by Members of the Federation of Cine Societies. Programme arranged by T. S. Lutas, A.R.P.S.

Tuesday, October 19th. 6 p.m. Meeting to be arranged by the Scientific and Technical Group.

Saturday, October 30th. 3 p.m. Meeting arranged by the Miniature Camera Group. "Experiences with the 2½ in. square Miniature Camera." By Bertram Hutchings, F.R.P.S.

Saturday, November 6th. 3 p.m. Meeting to be arranged by the Colour Group.

Saturday, November 13th. 3 p.m. "Spanish Architecture." By J. R. H. Weaver, M.A., F.R.P.S.

Saturday, November 20th. 3 p.m. Meeting to be arranged by the Kinematograph Section.

Saturday, November 27th. 3 p.m. "Meditations and Recollections: Fifty Years of Photography." By Charles Eshborn, A.R.P.S.

Saturday, December 4th. 3 p.m. Meeting arranged by the Miniature Camera Group. "Review of Literature and Developments of Interest to the Miniaturist." By Percy W. Harris, F.R.P.S.

Saturday, December 11th. 3 p.m. The Traill Taylor Memorial Lecture. To be delivered by E. R. Davies, B.Sc., F.R.P.S.

Saturday, December 18th. 3 p.m. Joint Meeting of the Scientific and Technical Section with the Association for Scientific Photography.

JOINT MEETINGS

Birmingham Photographic Society, York House, Great Charles Street, Birmingham. Tuesday, October 5th. 6.45 p.m. "Little England Beyond Wales." By G. E. W. Herbert, F.R.P.S. Tuesday, November 30th. 6.45 p.m. "A Tale of the Seven Seas." By Thomas W. Karan, A.R.P.S.

Bradford Photographic Society, The Science Room, Mechanics Institute, Bridge Street, Bradford. Saturday, November 27th. 2.30 p.m. "The Camera as a Means of Artistic Expression." By H. Barstow, F.R.P.S. Saturday, February 12th, 1944. 3 p.m. "Architectural and Record Photography." By J. Crowther Cox, F.R.P.S.

Bristol Photographic Society, The Grand Hotel, Bristol. Saturday, November 27th. 3 p.m. Lecturer: Percy W. Harris, F.R.P.S.

Bath Photographic Society, 13, Lower Borough Walls, Bath. Thursday, January 27th, 1944. "Camera Portraits and their Making." By Arnold Longman, F.R.P.S. Thursday, March 23rd. "Glimpses of the Alps." By Mrs. Emonet, A.R.P.S. **Leeds Camera Club,** Leeds Institute, Leeds. Monday, January 10th. "Lower Wensleydale, Past and Present." By H. Bryce Thomson, A.R.P.S.

Preston Scientific Society, Photographic Section, Ellesmere Chambers, Church Street, Preston. Sept. 21st, 7.15 p.m. "Infra-red Photography and its Applications." By A. Thompson, B.Sc., A.R.P.S.

Rotherham Photographic Society, The Crofts, Moorgate, Rotherham. Sunday, December 19th. "Against the Rules." A talk by H. T. Smith, A.R.C.A. Sunday, March 19th, 1944. "Approach to Natural History Photography." By Frank Newton.

EXHIBITIONS AT PRINCE'S GATE

September 4th to October 23rd. R.P.S. Annual Exhibition.

November. (1) Diamond Jubilee Exhibition of the Works of Alexander Keighley, Hon. F.R.P.S. (2) Prints by Dr. S. D. Jouhar, F.R.P.S.

December. (1) Photographic Alliance Competition Prints. (2) Colour Photography, arranged by the Colour Group.

January, 1944. (1) Prints by Mrs. K. M. Parsons, F.R.P.S. (2) Prints by Douglas Croall.

Feb. (1) Prints by Members of the Institute of British Photographers.

March. (1) Prints by Members of the Miniature Camera Group. (2) Prints by Lieut. R. G. Fennah, F.R.P.S.

THE PHOTOGRAPHIC JOURNAL

THE OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND
THE PHOTOGRAPHIC ALLIANCE

HONORARY ADVISORY EDITORS.—*Scientific and Technical Section* : C. WALLER, M.Sc., A.I.C., F.R.P.S.
Editorial Section : J. DUDLEY JOHNSTON, HON. F.R.P.S. *Kinematograph Section* : R. H. CRICKS, F.R.P.S.
EDITOR : H. H. BLACKLOCK, F.R.P.S.

VOLUME
XXXIII

NOVEMBER, 1943

TWO SHILLINGS
AND SIXPENCE



SALMESBURY OLD HALL

R.P.S. Annual Exhibition

J. T. SWARBRICK



Before opening the Exhibition, King Peter made a tour of the exhibits. In this photograph he is seen examining the colour transparencies in the Library, accompanied (left to right) by Mrs. Mortimer, Squadron-Leader A. MacKenzie, Mr. F. J. Mortimer, Mr. Thomas H. B. Scott, and the President, Mr. D. McMaster

Photograph by Percy W. Harris, F.R.P.S.

R.P.S. ANNUAL EXHIBITION

Opening Proceedings and Private View

King Peter of Yugo-Slavia formally opened the Annual Exhibition of The Royal Photographic Society on Friday afternoon, September 3rd. His Majesty, attended by Squadron-Leader A. MacKenzie, was received by the President, Mr. D. McMaster, and by the Vice-Presidents, Dr. Baines and Mr. F. J. Tritton, the immediate Past-President, Mr. F. J. Mortimer, Mrs. Mortimer, Mr. Thomas H. B. Scott Past-President, and Mr. A. E. Dent, Member of Council. A large and distinguished company was present.

THE PRESIDENT, in welcoming the King, said he thought he would find the Exhibition well up to its predecessors. Works had been submitted by 774 photographers, and 324 of them had been successful in having their works hung. "We are fortunate this year," Mr. McMaster continued, "in having a distin-

guished personage to open the Exhibition, one who is distinguished not only in his own right, but as a head of a heroic nation, our Ally in this war. In coming this afternoon to declare the Exhibition open, King Peter does us great honour."

KING PETER said: It is a great pleasure to me to have been asked to

open the Exhibition of The Royal Photographic Society of Great Britain. I am myself deeply interested in photography, and although I can only claim to be an amateur, I am able to appreciate to the full all the progress that has been made in the art of photography and the very high standard which has been

l in this country, a country
g in the very forefront of
raphic achievement.

ing at the wonderful exhibits
us, one is deeply impressed
amazing strides which have
made within recent times in
t which is now an indis-
se adjunct to science in all its
es.

ography is playing a vital part
war effort and in furthering our
n cause. Here we can learn
ing more about air photo-
colour photography, stereo-
photography, while, as for the
al examples of photography,
re here for our enjoyment. I
always been interested in
raphy, but when as a small boy
given my first camera I never

dreamed of the possibilities which lay
before anyone who would take the
pains to study both the art and
science of the subject.

Photography also plays a great
part in fostering cultural and
friendly relations between countries,
and I like to remember the British
tourists, armed with cameras, who
visited my own country. They
brought back snapshots to show their
friends, with the result that those
friends also made up their minds that
Yugo-Slavia was the place for their
next holiday. They came, and I hope
they were not disappointed with our
scenery, for, after all, photography
tells the truth, and that is why it is
becoming more and more popular.
Photography is almost everybody's
hobby nowadays, and I note that

the membership of The Royal
Photographic Society has grown
enormously. I also hope that be-
fore long we shall be welcoming a
great many of your members to
Yugo-Slavia.

Once again I want to thank the
Society for having asked me here
to-day, and to declare the Exhibition
open. (Loud applause).

The PRESIDENT thanked His
Majesty, an extremely busy man in
these days, for the courtesy of his
visit, and construed his words as an
individual invitation to each one
present to come and see his country.
Behind the words was the implication
that the possibility of such a visit
might not be long delayed.

The King remained some further
time studying the exhibits.

THE SCIENTIFIC AND TECHNICAL SECTION

By T. L. J. Bentley, D.I.C., A.R.C.S., B.Sc., A.R.P.S.

The pictorial prints and slides and the natural history photographs were reviewed in The Year's Photography."

Below, the scientific and technical exhibits, the colour prints and transparencies, and the stereoscopic slides are reviewed.

E London exhibitions of pic-
torial photography have, of
course, always to be "the best"
but even making allowances
for the exuberance of pictorialist
ers on these occasions, one is
ed by their insistence that the
d displays this year maintain
azingly high standard. This
will be shared by most of the
to the galleries of the R.P.S.
tion—until the journey is
upstairs to the room devoted
Scientific and Technical
At this stage the sad
on must in all honesty be
that scientific and technical
raphy falls well short of its
ds of other years.

paradoxical as it may seem,
hortcoming constitutes in
the best tribute which scien-
d technical photography could
in these present times. It is
sion of the difference in
a of pictorial photography and
al photography in war-time.
ection of pictorial photography
irational and propagandist.
ides a healthy escape from the
and horrors of war, nurtures
preciation of beauties, the
ent of which is at present
except in retrospect, and
s inspiration to persevere in
irations and endeavours to
better and saner world at the
these present troubles. With

such functions to serve, it is under-
standable that pictorial photography
should display the fertility and

virility on which the critics remark.

The function of scientific and
technical photography at this pre-



Here King Peter is seen examining the prints in the Pictorial Section, with the President, Mr. D. McMaster, and Mr. F. J. Mortimer
Photograph by F. H. Sharman, A.R.P.S.



Photomicrograph of Section of Lung of Coal Worker, showing the presence of inhaled Carbon Particles.
x 20 (approximately)

GENERAL REMARKS

The Section gives some idea as to the amount of foreign matter which may be inhaled by an unprotected worker in a dusty atmosphere.

In this Section there is very little tissue resembling normal lung, but the area marked by the circle "5" has some resemblance to normal lung substance. Although the inhalation of coal dust does not usually produce an inflammatory process, in this particular case there is evidence of fairly acute inflammatory reaction.

KEY TO PHOTOMICROGRAPH

1. Small cavities in lung substance formed by confluence of a group of Alveolae or Air Cells. The cell walls are broken down by frequent coughing.
2. Presence of coal dust particles in some of the smaller air passages. The small passages become blocked with fluid secretion in which the coal dust is suspended. By violent coughing the contents of these passages are removed from the body. This is one method by which the body expels inhaled foreign material.
3. Particles of carbon lying in the lung tissue.
4. An area showing fairly acute inflammatory reaction. All the air spaces are filled with inflammatory exudate.
5. Zone outlined by black ring shows tissue somewhat like normal lung substance. Note the small air cells or Alveolae, more or less empty and with walls intact. Comparison of this area with the inflamed zone (4).

Dr. Basil Hill

sent moment, on the other hand, is on a less spiritual, but none the less vital plane. It is its job, for example, to help create and place in the hands of the fighting men the tools and weapons of war—and without these the dreams by which the pictorialist is inspired would long ago have ceased even to be dreams. On this level of practical achievement the record of scientific and technical photography is one in which its disciples may well take pride; but this achievement finds no place in the present Exhibition. First, because it is a tale which, except in snatches, cannot yet be told; and, secondly, because those who would have to tell the story are still too insistently engaged in the pursuit of new developments and new applications to the problems of war to give time to the telling. After the war there will be an exceedingly interesting record to give of the achievements of applied photography.

Meanwhile, the 1943 Exhibition has to make what show it can with photomicrography and record photography, in directions which seem almost totally unconnected with the special problems and activities of the time. This spurious sense of detachment from actuality, in a display which normally makes many contacts with the busy world of human affairs, renders the scientific and technical section less satisfying than usual.

This atmosphere is, in fact, unfair to many of the exhibits. It is difficult, for example, to appreciate at their legitimate value those concerned with the reproductive cycle of marine worms, the larval stages of the shoe crab, or various forms of ciliated larvæ from the marine plankton. Yet this series of photographs by Douglas P. Wilson, from the Marine Biological Laboratory, Plymouth, deserves warm appreciation—not merely because it represents new work on the outermost fringe of invertebrate embryology, but because it is the work of a specialist who has not spared himself in his endeavours to make his subject intelligible and significant to the lay visitor.

The same commendation must be extended to Dr. Basil Hill for his photomicrographs of a section of a cat's intestine, showing infestation with round-worm parasites, and of a section of the lung of a coal-worker, showing particles of coal dust which have invaded the minute air passages and even penetrated the actual tissue of the lung. The latter, moreover, is of value as a sociological document which succeeds in making real contact with life.

G. H. McLean is another exhibitor with a significant story to tell, and his exhibit, "Cereal Scab on Wheat," makes plain the nature of this parasitic infestation and demonstrates its disastrous effect on the yield of grain in the crops infected. Here, as in the examples previously referred to, it is merely a question of supplementing the actual pictures with a short explanatory text.

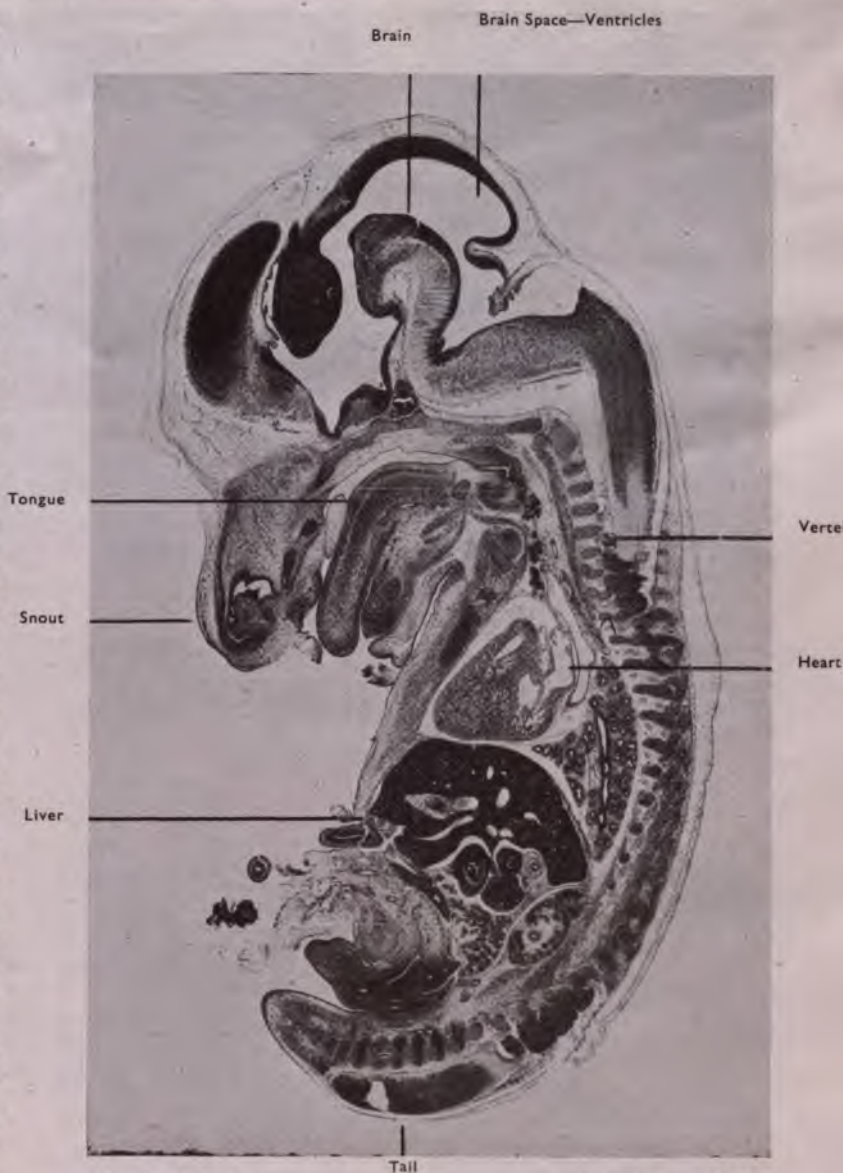
It is not as though a very elaborate commentary is always needed. For example, the photomicrograph by R. Sutherland Allen, showing the stem structure of Brazilian Liana by dark-field illumination, gains in interest and meaning on reference to a large dictionary, which informs us that a Liana is a climbing tropical plant with woody stems found in South American forests or Indian jungles. But why should visitors to exhibitions be supposed to carry large dictionaries around with them? Even if they did, it would be of little aid to them in establishing the identity of *Stenopteryx hirundinis* (shown in the first two exhibits in the room, by Treeby Bolton). This pair—and especially the macrophotograph showing the insect at twenty-five diameters in a natural environment—makes a very interesting and attractive study. But its interest to those of us who are not entomologists could so easily have been increased by a dozen words of formal introduction to *Stenopteryx hirundinis*.

The twelve photomicrographs of an embryo rat, by E. V. Willmott, ranging from complete sections at low power to sections of individual organs at comparatively high power, represent a very fine and accomplished piece of work, lacking nothing in technical quality or in presentation.

Studies of starch granules of different kinds, made with a projection microscope, by John Nicol, provide an interesting use of photomicrography, with a topical application.

A good geological pot-pourri is provided by A. V. Weatherhead with a series of rock or mineral sections—in one exhibit including some representative fossil plants—and for a comprehensive exhibit of this sort it is reasonable to assume a certain acquaintance with the subject on the part of the visitor.

F. J. Pittcock contributes two exhibits of value. From the scientific aspect his set of high-power ($\times 2000$) photomicrographs of human blood illustrating variations in the different types of white corpuscles, exemplifies the service which the photomicrographer can render to the cause of medical science. From the photographic aspect, his demonstration of the use of variable-contrast printing



Fifteen-day Embryo Rat

E. Victor Willmott, A.R.P.S.

paper in obtaining the optimum result in photomicrographs depends on using a high-contrast image as basis and supplementing it with the minimum of soft printing to get requisite detail throughout the field.

The group of medical exhibits is very small. It includes notably a set of pictures of a radium therapy unit, together with a convincing record of the successful treatment of a case of cancer of the ear by X-ray therapy, coming from E. V. Willmott, of the British Post-Graduate Medical School. Four chest radiographs by

O. M. Alexander show the typical appearances of pneumonia and tuberculosis. A series of clinical photographs and radiographs of cases of gout, in the hands and feet, by Dr. L. B. Bourne, is out of the common and a striking enough demonstration of the horrible deformations and dislocations of the bony structure which can accompany this condition. Emphatically a condition to be avoided!

A small group of miscellaneous exhibits includes a striking example of successful instantaneous photo-

4th (last) Zoea $\times 11$ Megalopa—lateral view. $\times 23$

Photomicrographs from life illustrating larval stages of the shore crab (*Carcinus maena*)

proved exceedingly useful in making up the deficiencies in other directions. This is not meant unkindly, because many of these prints are worthy of their place in any company, and

There are four zoeal stages in the development of this species, the fourth zoea moulting into the megalopa. The zoea swims with its paddle-like anterior limbs and by lashing with its tail; the megalopa swims with the large paddles on its tail. The anterior limbs of the megalopa are used for walking if it should happen to touch the bottom, but are kept folded against the sides and under the body while swimming. The great claws are formed and can be seen in the lateral view. The megalopa moults into the first true crab stage which gives up swimming to live on the bottom.

Douglas P. Wilson, M.Sc., F.R.P.S.

graphy by synchronised high-speed flash—a picture by A. L. Shuffrey, showing the shattering of a lamp bulb as it hits the floor. This is a technique which has proved of immense value in problems of a more serious kind, and this exhibit must be taken as a token of other examples of a kind which cannot at present be published. Another technically remarkable photograph is an underwater record of a swimmer diving, by A. Peacock; no particulars of the method used are provided. For the purposes of a photographic colour-printing process, R. G. McClymont rather indecently drags the gumbichromate process from its grave to demonstrate the possibility of employing water-colour pigments for the making of prints in colour—an interesting three-colour curiosity. Finally, in this section, comes a number of geological records taken in the field by Hallam Ashley: principally records of glacial deposits from East Anglia, showing the contribution which these deposits make to the Norfolk landscape.

Now we come to the second main section of the Exhibition—a very large collection of architectural records. These are noticeably uneven in quality, and, at a guess, these architectural records appear to have

there were definitely deficiencies to make good. Moreover, such records have gained a new value and dignity these days through the various survey record organisations which have attempted to cope with the risks of destruction of our ancient monuments by high-explosive and incendiary bombs, and few will question the propriety of giving architectural record photography a dominant place in this war-time Exhibition. Various details from Southwell Minster, recorded by H. M. Sheppard, set an exceedingly high standard at the outset, both in technical quality and in presentation: it is notable, for example, how the rendering of wood carvings gains in realism by the adoption of a warm-tone style of print. Wood carvings from Beverley Minster and York Minster are recorded with equal success by H. E. Illingworth and C. D. Milner. Other detail work of note includes F. J. Tyzack's record of the Chained Bible of 1640 from Thorpe Salvin, H. Felton's record of the effigies of the Savage memorial from Elmley Castle, and the quite outstanding series of records of monumental busts and effigies from Westminster Abbey from the camera of H. Gernsheim, including a long series of early kings and queens. This

Megalopa—dorsal view. $\times 11$

exhibitor has located and a rich vein which has been completely ignored by others in this field. In some cases notably that of Dr. Samuel J. the result might easily pass glance for a highly successful from life.

At the other end of the scale the pictures of the main structures of a number of cathedrals, shown pleasingly, a modest scale, in a series Felton.

Two other exhibits call for mention. H. G. Grainger records of the 12th century s



Merx Hirundinis. X20. Parasite on swallows

Treeby Bolton

ork affixed to the door of
gfleet Church, Yorks, and adds
mentary which brings out the
st and significance of these
at relics; it is, however, the
mely artistic and effective style
resentation which marks this
it out as distinct from all the

V. J. Watson, too, records an
esting antiquity from a York-
church—the Saxon stone cross
ckness Church; but in this case
pecial interest lies in the device
otographing in a mirror with a
ture camera, in order to record
scriptions on faces of the cross
are close against the wall and
ossible in the normal way.

final section is devoted, as
to industrial photography,
ity, news and stage photo-
y. Pictures in a steel factory,
H. Thorpe, and a magnificent
l of the requiem mass for
nal Hinsley, by *The Times*, are
inding. Also of special appeal
A. Bassett-Lowke's "Perfection
niature"—a record of a beauti-
executed model of a great liner.
addition, there are the technical
exhibits in the Library. These
rovided by Messrs. Ilford, Ltd.,
Messrs. Kodak, Ltd.

Ilford exhibit is devoted to a
nstration of miniature radio-
y and to the organisation of
radiographic services in indus-
establishments. It consists of a
of panels of pictures illustrating
tail the whole of the procedure
mass examination of a factory
and a model showing a satis-

factory arrangement of rooms giving
a one-way traffic, and thus aiding
rapid handling of large numbers of
persons. It is emphasised, in parti-
cular, that the great merit of minia-
ture radiography compared with
normal radiography is not so much
the economy in film material,
important though this saving is, but

rather the very much greater speed
with which the whole examination
can be put through. When dealing
with large factory groups on the lines
indicated in the exhibit, the average
time for each individual examination
is only fifteen minutes; and it is this
fact which makes large-scale exam-
ination within a factory organisation
economically possible. The display,
of course, explains both the principle
of the method, as being the recording
with a camera using 35 mm. film of
the shadow-picture of the chest
formed by an X-ray beam on a
fluorescent screen, and its practical
value as a means of detecting
tuberculosis before clinical symptoms
appear. But so much is already
within the knowledge of newspaper
readers, and the real object of the
display made by Messrs. Ilford is to
demonstrate mass miniature radio-
graphy as constituting a health
service which factory and other
industrial organisations will be pro-
viding as a matter of course in the
near future.

The exhibit made by Messrs.
Kodak, Ltd., falls in three sections.
The first deals with the newly-
introduced Kodak Transfer Sensi-
tising process, by means of which
large sheets of metal, wood or plastic
material can be sensitised for the
rapid production of working drawings
in situ on the surface to be worked.
As shown pictorially, this sensitisa-
tion is done by transferring a dried



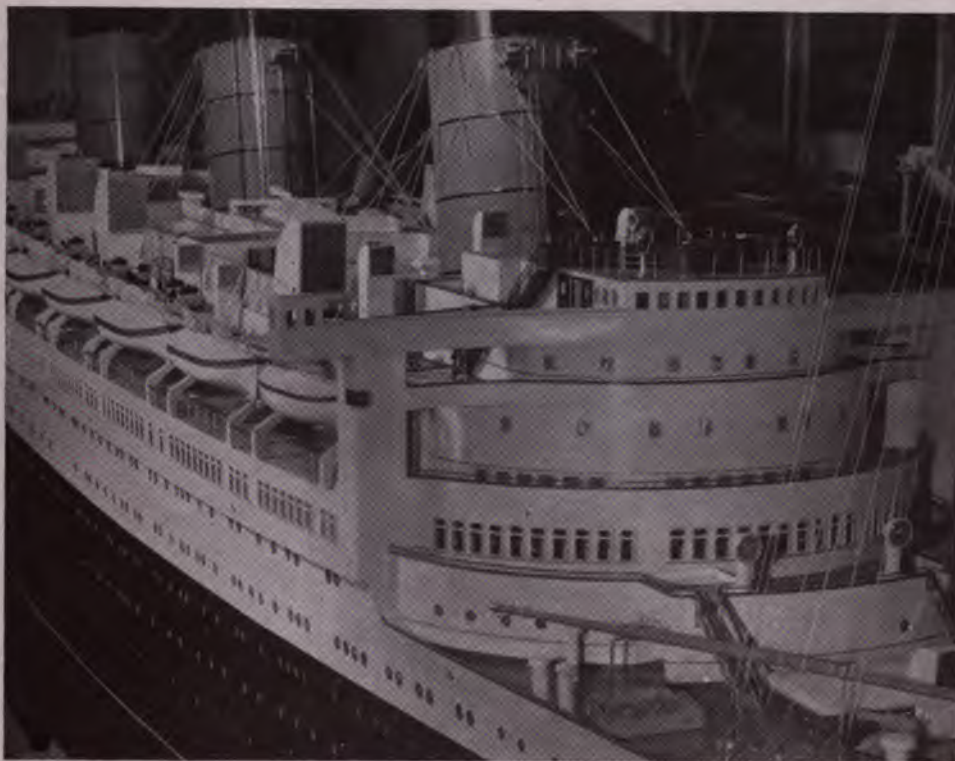
Breaking Lamp Bulb

A. L. Shuffrey

*Home Front*

British Council

Harold White, F.R.P.S.



Perfection in Miniature

H. A. Bassett-Lowke

sitive silver halide layer from a clipping paper base; and the application of the method in aircraft production, as also in the making of instrument dial and panels, is shown actual examples. Another section concerns the "Airgraph" letter vice, which was developed and inaugurated by Kodak in conjunction with the G.P.O. to expedite postal services to H.M. Forces in the Middle East; the system depends on the making of micro-copies of the completed "Airgraph" forms on 16 mm.

film for easy transport by aeroplane, and the reproduction of enlarged "Airgraph" copies for delivery to the addressees. Pictures of the micro-copying, processing and enlarging installations in use give an idea of the extensive plant which is needed to maintain the "Airgraph" services. The rest of the Kodak exhibit discloses a number of developments in colour photography which are already achieved, but cannot be made available under war conditions.

These processes—the "Kodachrome" process for professional use, the "Kotavachrome" professional colour prints, "Minicolor" prints from miniature "Kodachrome" transparencies and "Kodacolor" prints from roll-film colour negatives—have all been described in British photographic journals, but this exhibit gives the British public the first opportunity to judge for itself the new facilities for colour photography which it may look forward to enjoying after the war.

THE COLOUR TRANSPARENCIES

By W. A. Poucher, F.R.P.S.

THE five cases in which the colour transparencies are exhibited this year occupy their usual position in the Second Floor Landing. Taken as a whole, the most striking feature is the contrast between the brilliance of the many Kodachromes, the few facolors, and the subtle shades of innumerable Dufays. During the short time I was there writing these notes, I was surprised at the large number of people who showed an intense interest in this section, but in the time they devoted to each

case and from the remarks I overheard, it was obvious that the landscapes exercised the greatest fascination upon them.

The scientific section occupies the first case, and displays some remarkably fine slides. Of the very interesting set shown by Dr. F. S. Airey, No. 610 had perhaps the strongest appeal to the non-medical viewer, because it clearly illustrates the effects of a facial X-ray burn. The collection exhibited by R. McV. Weston, A.R.P.S., is noteworthy, since, with the excep-

tion of No. 615, they were all taken with polarised light, and display a galaxy of colours fit to adorn an Aladdin's Cave. Nos. 623 and 624, of Salicine, are outstanding for quality and brilliance. Joshua Levi's slides would doubtless be of inestimable value to dentists wishing to study the characteristic changes in form and colour due to various types of periodontoclasia, of the soft tissues supporting the teeth.

Narrow shadowed streets always present a difficult problem to the

colour enthusiast, but in No. 737 A. R. Wood has recorded every detail of the white enclosing walls and enlivened the scene by the inclusion of two gaily attired ladies. In No. 741, G. L. Stollery gives a true representation of the familiar Marigold growing beside a garden path of which the stones appear more greenish than one would have expected. F. H. Sharman, A.R.P.S., has in No. 745 captured the scintillating summer sunshine on an alluringly situated bathing pool, which contrasts strangely with No. 746, by W. Cdr. O. M. Fraser, where a less luminous lake is set amid the blue, snow-capped hills. No. 748, H. Courtney Bryson, taken from the garden of the Royal Hotel at Capel Curig, breathes of early morning sunlight in Snowdonia, and exhibits opposing tones to No. 749, by R. Binder, who portrays the delicacy of a mellow sunset where the purples and mauves merge with the golds through a screen of trees. E. Broomer, F.R.P.S., shows two splendid examples of nature's wizardry in which the white boles of the birches in No. 750 reflect the summer sunshine, and where 759 captures the brilliant golden hues of autumn. No. 751, by A. Lewis Jones, is an unusual subject, where the low lighting not only throws into relief every detail of the starfish, but also every grain of sand on which it lies. There are two studies of water lilies: No. 752, by J. G. Galt, is all in focus and taken

with better lighting than No. 756, by P. Johnson, F.R.P.S., which is marred by a shadow on the left of the bloom. The latter artist, however, excels with his interiors Nos. 753, 755 and 758, where the marvellous luminosity is worthy of study by all who are interested in this type of subject. L. St. Swieicki provides a nostalgic picture, especially in these days of rationed food, for his 754 looks like a feast for the gods!

H. Courtney Bryson catches the sunlight on the white walls of Pen-y-Pass in his No. 761, which admirably portrays the familiar scene. It suffers from a slight error of composition, however, in that undue prominence has been given to a great cloud sailing over the Glyders, which has brought the hotel perilously near to falling out of the picture. It would have been better with the building dead on the third. "Fire Worship," No. 763, by R. S. E. Hill, is one of the most fascinating slides in the Exhibition, the naked figures being dimly perceived against the smoke from a glowing woodland fire, and even the shadowed lady poking the embers on the right being discerned amid the gloom of the forest. There is an excellent example of the subtle lighting of glassware in a good composition, No. 767, by A. E. Lockington Vial, F.R.P.S., while in 769, P. S. H. Henry has succeeded in capturing the mystery of the sea's incessant movement. Returning again to the mountain

scene, C. Douglas Milner, A.R.P.S., has appropriately titled his slide, No. 770, which shows the leafless erect larches in the foreground of his "Blue Remembered Hills," above which the dissipating spring snows reveal the blues and greens of the distant mountains.

Perhaps the cleverest study is No. 771, where Miss M. Harker, F.R.P.S., shows an astonishing example of colour photography; the lighting ranging from the brilliant sunshine illuminating the arch and steps of "The Alley Way," to the subtle hues of the walls and the figure on the left of the doorway. Flowers are again prominent in No. 772, by Miss Isobel Simpson, where the tulips and narcissi might well be a gentleman's offering to a lady, and in 774 and 776, by H. T. Harper-Roberts, who has pictured so true to life both daffodils and narcissi. No. 775, by Allan P. Morris, is titled "Experiment No. 2," and is an outstanding example of the pictorial analysis of the three primary colours on the subject of a Grecian head.

Fred Harrison has contributed a fine winter study of Derwentwater in his No. 777. The portrayal of the water and misty atmosphere is excellent, but the composition suffers by reason of the cut tree on the right with a glimpse of Skiddaw in the background. The sheep in the foreground add much to the charm of the picture. No. 779, by W. Ellison, is also a lake study in blue, and while the tints are delicate enough, they lack the subtle charm of the previous slide. In No. 782, J. D. Godber, A.R.P.S., shows a collection of boats at Tenby, and the study is remarkable for the luminosity of the ropes against the shadowed background of the quay. Miss A. B. Warburg, F.R.P.S., contributes two slides, of which No. 784 depicts the Foot Bridge at Dunster. The result is amazing considering the dim lighting, for not only can detail be perceived in the deeply shadowed walls of the road, but the weak luminosity of the stream imparts a note of enchantment to the scene. No. 785, by G. F. Harris, A.R.P.S., is a splendid example of a magnificent cloud formation against a purple sky, where every gradation of the former is apparent. G. H. Wright, in his No. 788, "May I Stay?" captures a familiar incident to perfection; the different dresses of the two ladies contrasting well with the stone walls of the cottage.

The outstanding snow study of the show is No. 789, "On the Edge of the Wood," by Dr. W. C. Fothergill, A.R.P.S., where the rendering of the brilliant lighting and delicate shadows



Temporal Power, Southwell



H. M. Sheppard, A.R.P.S.

the snow is superb; even the trees showing the mystic blue of winter. Nos. 791, 792 and 793, by the Hon. M. W. Stonor, F.R.P.S., are deserving special mention as excellent examples of portraiture in Kodachrome. No. 791 is one of the finest I have seen where skin texture, eyes and mouth are of superlative quality. The two of the Royal Princesses are excellent, but I should have preferred a more contrasting background.

THE COLOUR PRINTS

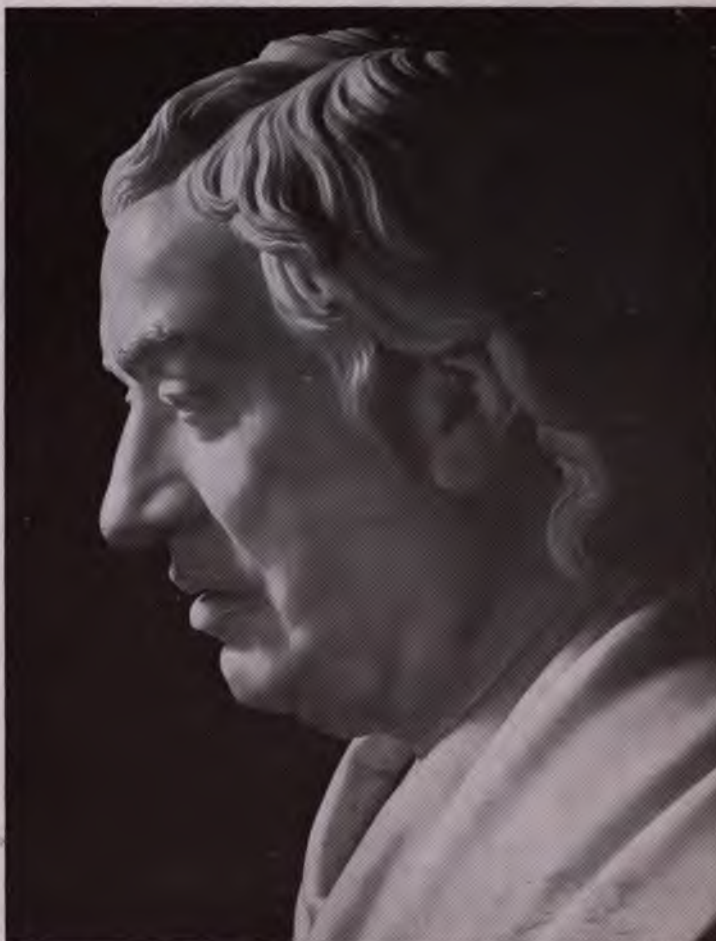
By F. W. Coppin, F.R.P.S.

All who have tried will know, that much patient labour is required to make a colour print of exhibition standard, so that it is not surprising that only twenty prints are on display this year, when everyone has so little spare time. Not all the prints are up to exhibition standard, and I expect that some of the exhibitors consider themselves fortunate that the judges did not have a larger number to select from.

In my opinion, No. 388, "The Red" by Ernest Letten, is quite the best colour print in the Exhibition. The pictorial arrangement and lighting are excellent, while the colour balance and technique are of a high standard. This exhibitor has submitted other prints all of which are of a technical standard, and though not stated in the catalogue which process was used, they are undoubtedly Carbro prints.

Our Carbro prints by John Hinde very well illustrate his expert skill. No. 379, a close-up of an appetising piece of lettuce, the leaves wet with water, is a superb example of the effectiveness of colour photography in advertising or recording. The varying shades of green seen through the droplets make the photograph really pleasing. No. 377, "The Orchid," by Mr. Hinde, is a good example of flower photography, and, in fact, all four prints by this exhibitor are technically satisfactory.

A good example of the Wash-off process is No. 383, a portrait of a child by Symon, by Col. W. Symon, of a high quality in this print being particularly pleasing. No. 372, "Meadow in Spring," a Tricarbro print by F. R. Stonor and J. Martin Cross, deserves mention, as does No. 374, where a five weeks' old kitten has been introduced into stillness in this portrait of a child, "Matilda," and No. 385, "Home," an attractive picture, somewhat overexposed by high-contrast mottle, of the interior of a comfortable room.



Dr. Samuel Johnson, Westminster Abbey

H. Gernsheim, F.R.P.S.

Finally, mention should be made of prints Nos. 370 and 375, which are interesting as being the first examples of the Kodacolor process that have appeared in the colour section of the Annual Exhibition.

THE STEREOSCOPIC SECTION

By G. E. W. Herbert, F.R.P.S.

WHILE, at the present time, Stereoscopic Photography is receiving much attention in the scientific world and looming conspicuously in the war effort, it should be understood that the following few comments on the stereoscopic pictures in this year's Exhibition are concerned only with that aspect of this branch of Photography that aims at giving pleasure to the ordinary man.

One of the most striking features of this ever-popular section is the very limited number of workers who contribute to it, for only seventeen names appear in the catalogue. The truth is that, while the aforesaid ordinary man is thrilled at the novelty of seeing pictures in relief, the majority of amateur photographers, indifferent to a thrill that calls for special taking and viewing apparatus, allow the stereoscopic



Interior, Chillon (Print)



The late Herbert Pickwell, A.R.P.S.



A section of the Gallery in which the pictorial prints were shown. Some of the stereoscopic viewing cabinets are seen on the left.
Photograph by Percy W. Harris, F.R.P.S.



Model Railway (Print)



P. B. Dannatt



Native Potter, Marrakesh (Transparency)



S. E. French, A.R.P.S.



All Eyes on the Screen (Transparency)



Miss Isobel Simpson



A Welsh Valley

Mrs. K. M. Parsons, F.R.P.S.

fraternity to remain a race apart. The latter make very few converts, and, judging from most of the entries submitted to recent R.P.S. Exhibitions, are content to make each year a few stereograms of holiday scenes, mostly topographical, seemingly unaware of the immense variety of subjects lying ready to their hands upon which more ambitious pictorial workers base their experiments in picture-making.

One need only compare the stereoscopic exhibits with those of the two lantern slide sections to appreciate how neglectful stereoscopic workers of to-day are of such subjects as portraiture, child studies, natural history, still life and table top, snow and sun pictures, market and street scenes, men at work, and so forth; and to realise how immensely more attractive and worthy the attention of serious photographers the section would be if, in variety of subject matter, it equalled the lantern slide section with transparencies of similar quality—if only, in short, slide-makers would take up stereoscopy.

To a question we older ones often

ask ourselves, "Where is the new generation who are to carry on the practice of stereoscopy in times to come?" the most hopeful answer I can suggest is that they are waiting for the opportunity to buy a stereoscopic camera that will take the 120 roll-film and enable them to make 6 by 13 cm. pictures in monochrome or in colour, and more particularly in colour. But one gets weary of labouring the desirability of English-made two-lens cameras of this serviceable type. Until they come on the market, however, stereoscopic photography must continue to decline.

Coming now to this year's Exhibition, some very fine prints on P.O.P., or toned glossy bromide, mostly landscape and holiday records, have been contributed by E. C. Sykes ("On Loughrigg Fell"), C. M. Rothwell ("Tryfan"), and Edwin R. Harbron ("Kex Beck, Wharfedale"). Mr. S. E. French's twenty prints are also records of holidays, but with a difference—comprising as they do studies of the life and character and daily pursuits of Mediterranean folk seen on summer cruises. All are full

of soft sunshine, obviously from negatives of ideal quality. The only other display of prints is a very fine loan collection from the work of the late Herbert Pickwell. These make a strong appeal by their inclusion of some of the many interesting features and treasures to be found in our English parish churches—subjects that lend themselves admirably to representation in three-dimension photography.

In monochrome transparencies, Miss Isobel Simpson has broken away from her usual studies of Scottish glen scenery with a slide of very human appeal, "All Eyes on the Screen," while P. B. Dannatt has an equally homely subject, "Model Railway." These are two experiments in the very kind of subject whose absence (both from accepted and rejected entries) I have just been deploring. But one or two swallows do not make a summer!

Among other items worthy of mention are Mr. J. Stuart Hill's transparencies of the West Country landscape, rendered in the beautiful warm-black tone we associate with his work, and Mrs. Clifton Tabor's



A section of the Lantern Slide case, photographed by the light in the case, the camera held in the hand : Percy W. Harris, F.R.P.S.

"Woodland"—a gem in *contre-jour*.

Four cabinets are devoted to colour. One of the most attractive studies, cut down to show the tiniest picture space—a small portion only of a 35 mm. Kodachrome—is Mr. C. M. Rothwell's "Alderley Woods," most brilliant and exquisite. Mr. F. H. Brittain also has sent in some Kodachromes. Of his baker's half dozen, I plump for "Preparing to Sail," upon, incidentally, the bluest of blue waterways. No one who knows Rev. B. Wright's flair for working the Dufay process need be told that his many fruit and flower studies this year are as good as ever. I particularly admired the bloom (slightly defaced by touch) on his "Plum—Belle de Louvain."

Mr. E. R. Slessor, a newcomer, also favours Dufays. His thirteen slides are all of great charm. "Goldfish in Pond" is doubtless the finest, but it is run very close by "Cherry Blossom"—each a delight.

Another adept at Dufay, and a pillar of support to the section, is the versatile Edwin Broomer. He has been very successful in depicting the

fall of the year, witness "Leaf Screen" and "Autumnal Glory," but he delights us still more with such whimsical fancies as "Merry Berry Folk" (some comical little characters from the land where the "Goose-gogs" grow) and "Gnome Town" (a specimen of fungus only needing Latin nomenclature to qualify for the Natural History Section), while his two child studies, "Ready for Bed" and "—and Keep us Safe" are everybody's pictures.

A fine contribution to the Stereoscopic Section is the loan collection of autochromes by John Innes. This is a treasure house of colour, showing every variety of subject—interiors, street scenes, articles of vertu, portraits, flower studies, etc. Their rich quality and depth of colour will surprise and delight many who cannot but be impressed with the excellence colour photography had attained in the hand of a master some thirty or more years ago.

THE GREEN CROSS SOCIETY

We have already referred to the photographic competition organised by the Green Cross Society ("Items of Interest from Various Quarters," April, p. 158), "Wild plants fight on the food front."

In addition to the prizes already announced, Messrs. Heath & Heather, Herbalists, are offering supplementary prizes, and may also be prepared

to purchase the copyright of selected photographs submitted to the competition.

The closing day is December 31st.

Entry forms and all further particulars should be obtained from the Honorary Organiser, Mrs. M. H. Morrison, 41, Asmunds Place, Hampstead Garden Suburb, London, N.W.11.



THE ON THE INTENSITY OF FILTERED LIGHT SOURCES USED IN PHOTOGRAPHIC SENSITOMETRY

By E. T. Purslow

Introduction

Subject of this note is to call attention to a possible source of error in photographic sensitometry and to make an attempt to determine its magnitude.

At the Tenth International Congress of Photography, held in London in 1937, the following resolution was adopted:—

"The Commission recommends to the national committees that the photographic unit of intensity for sensitometry of negative materials shall be defined as the intensity of a filtered source of radiation giving a luminous intensity of one international candle and produced by a grey body at a colour temperature of 2360°K, together with a selectively transmitting filter made up as follows:—"

This allows a description of the Davis-Gibson filter to modify the spectral energy distribution of light from a black body at a temperature of 2360°K to that of a grey body worked at a colour temperature of 2360°K, together with the filter mentioned. The Davis-Gibson filter is not a very efficient light source, and this is a serious inconvenience when high intensities are necessary. Though the 2360°K source is rarely used, a large amount of routine sensitometry is carried out using a lamp operated at a colour temperature of 2850°K with the appropriate Davis-Gibson filter to convert to W.M.N.S., as before, basing photographic intensity on the candle power.

Reference to the tables dealing with the Davis-Gibson filter shows that the composition of the light obtained is very nearly the same for the two-lamp and filter combination. In these tables the relative intensities of the light have been adjusted to make the numerical value of energy radiated in the wave band 4000—7000 Å. the same in all cases. For wavelengths above 4200 Å. beyond the limits of the visible spectrum the ratio of intensity between the two sources under consideration nowhere amounts to more than 3 per cent. At 4000 Å. the 2850°K combination gives more than 250 A.U. it is radiating three times as much energy as the 2360°K combination. Although the light radiated over this wavelength range is comparatively small, it is nevertheless a spectral region to which photographic emulsions and especially chloride emulsions are particularly sensitive.

It cannot be assumed, therefore, that a sensitometer using a 2850°K combination source will give the same results as a sensitometer using a 2360°K combination source, and it is a matter of some importance to measure such discrepancies as are likely to occur in practice. A convenient way of expressing such a discrepancy is by means of the factor R, by which the energy of the 2850°K combination source must be multiplied in order that the sensitometric results obtained be equivalent to results obtained with the 2360°K combination source. The value of R will be seen to depend on the colour sensitivity of the emulsion concerned.

II. Calculation of R

The factor R introduced above can immediately be expressed in spectro-photometric terms as:—

$$R = \frac{\int M'J'(\lambda) t'(\lambda) P(\lambda) d\lambda}{\int MJ(\lambda) t(\lambda) P(\lambda) d\lambda} \bigg/ \frac{\int M'J'(\lambda) t'(\lambda) V(\lambda) d\lambda}{\int MJ(\lambda) t(\lambda) V(\lambda) d\lambda} \quad (1)$$

where $MJ(\lambda)$ = Energy of wavelength (λ) /unit of wavelength radiated/unit solid angle in the forward direction from the filaments of the lamp,
 $t(\lambda)$ = Transmission of the filter to light of wavelength (λ) ,
 $M'J'(\lambda)$, $t'(\lambda)$ are similarly defined with respect to the 2360°K combination source.

$V(\lambda)$ = Luminosity function as defined for the C.I.E. standard observer,

and $P(\lambda)$ = Spectral sensitivity function of the photographic emulsion under the appropriate conditions.

Though the constants M and M' cancel out in the expression for R, they are formally introduced so that any convenient set of figures giving the relative spectral energy distribution of the light from the lamps may be used for $J(\lambda)$ and $J'(\lambda)$.

The factor R is, of course, a function of $P(\lambda)$ and only equals unity in certain special cases.

If the assumption is made that the lamps act as grey body radiators, $MJ(\lambda)$ and $M'J'(\lambda)$ will follow the Planckian distribution. The Davis-Gibson paper tabulates $MJ(\lambda) t(\lambda)$ and $M'J'(\lambda) t'(\lambda)$ at 100 Å. intervals for radiations following this distribution with M and M' in effect chosen to make:—

$$\frac{\int_{4000}^{7000} M'J'(\lambda) t'(\lambda) d\lambda}{4000} = \frac{\int_{4000}^{7000} MJ(\lambda) t(\lambda) d\lambda}{4000} = \text{a constant.}$$

(This information is given on pages 138 and 141 of the paper under the heading E'').

The standard values for $V(\lambda)$ are also given (page 54).

The factor R can, therefore, be readily calculated for any given form of $P(\lambda)$.

As a preliminary measure, diagrams 2a and 2b were prepared. These indicate the extreme values of R to be expected in certain special cases and were of use in selecting a representative set of emulsions for detailed examination.

In these diagrams, R is shown as a function of λ_0 in the hypothetical case:—

- When $P(\lambda) = 0$ except at wavelength λ_0 , i.e., the emulsion is sensitive to light of one wavelength only.
- When $P(\lambda)$ has a constant value between $\lambda_0 + 250$ Å. and $\lambda_0 - 250$ Å. and equals zero at all other values of λ .

The curve relating to the first of these two cases confirms the belief that the largest values of R occur with emulsions having most of their sensitivity in the blue and ultra-violet, while that to the second shows that even when sensitivity extends over a wide range of wavelengths quite large departures of R from unity may be expected.

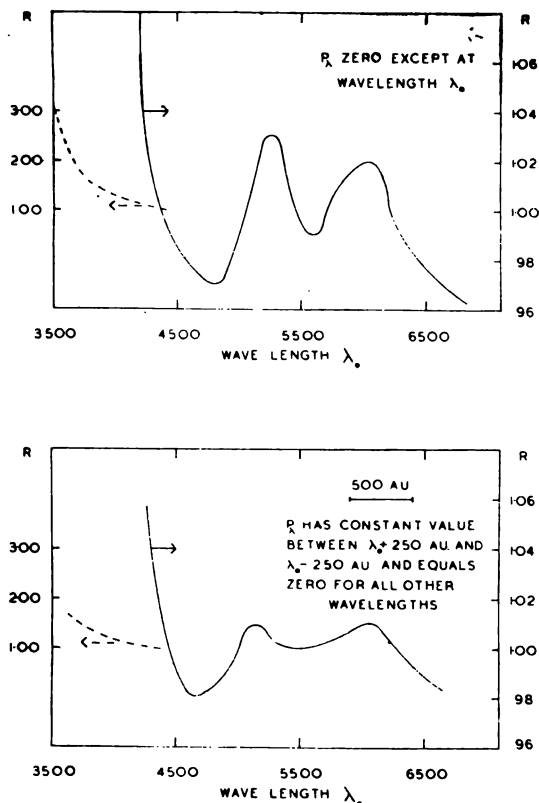


Fig. 2a (top diagram) and 2b (lower diagram)

In diagrams 3a and 3b are shown the spectral sensitivity curves of a number of emulsions, and the corresponding R values. The evaluation of the integrals of (1) in the expression giving R was carried out by a weighted ordinate method.

III. Spectral Sensitivity of Emulsion

The spectral sensitivity of the emulsion $P(\lambda)$ was obtained from the isopaques of a wedge spectrogram by means of the relation :

$$\log. P(\lambda) \cdot j(\lambda) = \text{Constant} + G(\lambda) \cdot h(\lambda)$$

where $j(\lambda)$ = Relative spectral energy distribution of the source used in exposing the spectrogram.

$h(\lambda)$ = Length of intercept between the isopaque and the datum line for wavelength λ .

$G(\lambda)$ = Effective density gradient of wedge to light of wavelength λ .

It is, of course, a convenience if the wedge is sufficiently neutral for $G(\lambda)$ to be taken as a constant. The imperfect neutrality of most wedges results in $G(\lambda)$ varying by a few per cent over the wavelength range 3500 Å.U. to 7000 Å.U. The form of $P(\lambda)$ depends to a certain extent on the density of the chosen isopaque. Differences due to this cause are, however, small compared with differences between even similar types of emulsion, so that the values of R obtained need not be restricted to a narrow range of image densities.

From the way in which the value of R obtained by relation (1) is interpreted it is implied that $P(\lambda)$ is measured

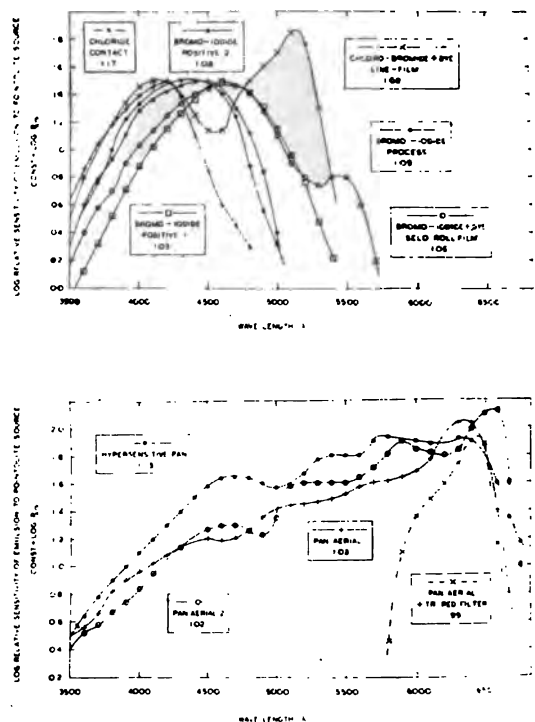


Fig. 3a (top diagram) and 3b (lower diagram)

under conditions of exposure similar to those used in the sensitometer. The exposure times necessary to produce wedge spectrograms are usually some hundreds or thousands of times as long as those used in ordinary sensitometry or in the direct experimental determination of R described later, and the form of $P(\lambda)$ might be expected to change over these widely different conditions. It is, therefore, comforting to find that the results obtained by Webb (*J. Opt. Soc. Amer.*, **23**, p. 157, 1933, and **25**, p. 4, 1935) on reciprocity law failure as a function of wavelength, can be interpreted to show that this is not so, and that $P(\lambda)$ may in fact be considered as independent of the exposure time.

IV. Experimental Determination of R

The values of R shown in diagrams 3a and 3b follow inevitably from the data used in the calculation—i.e., spectral emission of the lamps, absorption of the Davis-Gibson filters, spectral sensitivities of the eye and photographic emulsion. It was thought worth-while to demonstrate that substantially the same results could be obtained by an independent direct experimental method.

The two combination sources (lamps and filters) were set up on an optical bench on opposite sides of a photometric head, and a photometric balance point obtained by moving the 2850°K lamp. Duplicate settings were made with the head rotated through 180°.

If d_o - Distance between filaments of 2360°K lamp and receiving surface of photometer head,

d_1 :- Mean distance between filaments of 2850°K lamp and receiving surface of photometer head at the balance point.

on the snow is superb; even the trees catching the mystic blue of winter. Nos. 791, 792 and 793, by the Hon. M. W. Elphinstone, F.R.P.S., are deserving of especial mention as excellent examples of portraiture in Kodachrome, of which 791 is one of the finest I have seen, where skin texture, eyes and hair are of superlative quality. The other two of the Royal Princesses are first rate, but I should have preferred a more contrasting background.

THE COLOUR PRINTS

By F. W. Coppin, F.R.P.S.

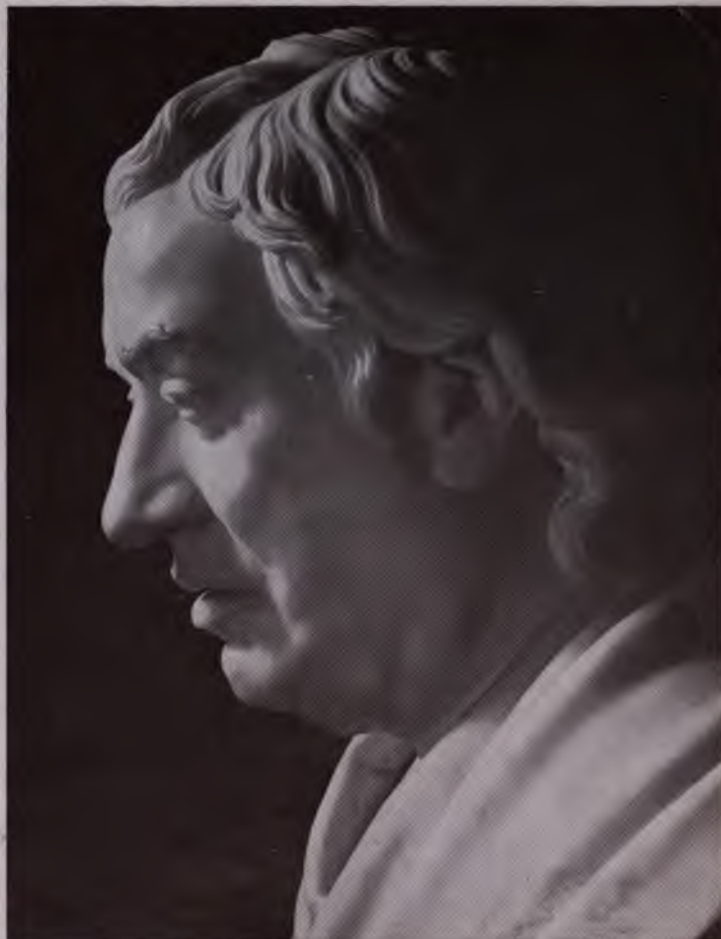
AS all who have tried will know, much patient labour is required to make a colour print of exhibition standard, so that it is not surprising that only twenty prints are on show this year, when everyone has so little spare time. Not all the prints are up to exhibition standard, and I suspect that some of the exhibitors can consider themselves fortunate that the judges did not have a larger number to select from.

In my opinion, No. 388, "The Red Bag," by Ernest Letten, is quite the best colour print in the Exhibition. The pictorial arrangement and lighting are excellent, while the colour balance and technique are of a high order. This exhibitor has submitted three other prints all of which are of a high technical standard, and though it is not stated in the catalogue which process was used, they are undoubtedly Carbro prints.

Four Carbro prints by John Hinde clearly illustrate his expert skill. No. 379, a close-up of an appetising cabbage lettuce, the leaves wet with dew, is a superb example of the effectiveness of colour photography in advertising or recording. The varying shades of green seen through water droplets make the photograph pictorially pleasing. No. 377, "Hardy Orchid," by Mr. Hinde, is a very good example of flower photography, and, in fact, all four prints by this exhibitor are technically satisfactory.

A good example of the Wash-off Relief process is No. 383, a portrait of Cadet Symon, by Col. W. Symon, the flesh quality in this print being particularly pleasing.

A landscape, No. 372, "Meadow in Somerset," a Tricarbro print by F. R. Newens and J. Martin Cross, deserves mention, as do No. 374, where a lively five weeks' old kitten has been coerced into stillness in this portrait of "Matilda," and No. 385, "Home," an attractive picture, somewhat spoilt by high-light mottle, of the corner of a comfortable room.



Dr. Samuel Johnson, Westminster Abbey

H. Gernsheim, F.R.P.S.

Finally, mention should be made of prints Nos. 370 and 375, which are interesting as being the first examples of the Kodacolor process that have appeared in the colour section of the Annual Exhibition.

THE STEREOSCOPIC SECTION

By G. E. W. Herbert, F.R.P.S.

WHILE, at the present time, Stereoscopic Photography is receiving much attention in the scientific world and looming conspicuously in the war effort, it should be understood that the following few comments on the stereoscopic pictures in this year's Exhibition are concerned only with that aspect of this branch of Photography that aims at giving pleasure to the ordinary man.

One of the most striking features of this ever-popular section is the very limited number of workers who contribute to it, for only seventeen names appear in the catalogue. The truth is that, while the aforesaid ordinary man is thrilled at the novelty of seeing pictures in relief, the majority of amateur photographers, indifferent to a thrill that calls for special taking and viewing apparatus, allow the stereoscopic

The values of R obtained by substituting experimental values of d_2 and d_1 in the relation (3) are shown in Table I. Taking into account the fact that it was not possible to use the same batches of material as were used in obtaining the wedge spectrograms of sections II and III, upon which the calculated values of R were based, the agreement is reasonably good.

VI. Conclusion

Examination of the R values and the associated spectral sensitivity curves of the emulsions shown in diagrams 3a and 3b, suggest that in the case of panchromatic materials the substitution of W.M.N.S. based on a 2850° lamp for W.M.N.S. based on a 2360° lamp results in errors that are negligibly small. The effective exposure given the emulsion being tested would be 2 or 3 per cent too high, and this would result in the photographic speed being about 0.01 too high in log. exposure units. Errors of this order are of no consequence in ordinary sensitometry.

The results obtained with non-panchromatic emulsions are difficult to summarise briefly or present in a simpler form than that of diagram 3a. The ortho-chromatic line film and the non-colour sensitised positive film No. 2 both have R values of 1.08, so it is clearly useless to attribute a certain range of R values to non-colour sensitive emulsions and another range to orthochromatic emulsions. The R value of 1.09, the maximum obtained with non-colour sensitised bromo-iodide emulsion, corresponds to a log. E difference in speed of 0.04, while the R value of 1.17 for the pure chloride emulsion corresponds to a log. E speed difference of 0.07.

If any general conclusion can be drawn from the results presented it is that errors due to the indiscriminate use of 2360°K and 2850°K combination sources are only likely to cause confusion in the case of a small class of photographic emulsions characterised by a sensitivity very much higher to ultra-violet and far blue light than to light of the longer wavelengths.

The Author wishes to express his thanks to Ilford Limited for permission to publish this paper.

SELO PHYSICS LABORATORY,
13th October, 1942.

Experimental Results

TABLE I

Photographic Materials	Density	R_p/R_v	This column is included for comparison purposes and gives the calculated values of R_p/R_v for the materials named
Contact*	.4	1.25	Contact 1.17
Cine Positive			
A	.8	1.13	Cine Positive 1.085 Process 1.09
A	.6	1.13	
A	.7	1.09	
B	.6	1.06	1.06
B	.5	1.05	
B	.5	1.10	
B	.6	1.02	
C	.8	1.08	1.10
C	.8	1.07	
C	.7	1.13	
C	.7	1.09	
C	.9	1.14	
C	.9	1.12	
Orthochrome	.5	1.06	1.06
	.5	1.06	
Cine Negative	.9	1.04	1.02
	.8	1.02	
	.8	1.00	
Cine Neg. + Tri Red Filter	.3	1.01	Pan Aerial .99 + Tri Red Filter

* Not obtainable as 35 mm. film. Very few exposures made

THE SCIENTIFIC FILM GROUP

In view of the rapid increase in the applications of photography in science and industry, the West Midland Area of the Association of Scientific Workers has formed a Scientific Film Group. The aims of this group are two-fold. Firstly, by means of lectures, exhibitions and news letters containing abstracts from recent publications, it will provide valuable information for scientific workers using photographic techniques in industrial processes and research laboratories. This section of the scientific community urgently needs facilities for exchange of knowledge and opinion. The Scientific Film Group

will supply these facilities, and, at the same time, foster interest in the manifold applications of photography. It has already set up an information service, which provides expert advice on all aspects of photographic technique.

The second aim of the Scientific Film Group is to meet the public demand for good quality scientific films, covering the whole field of science and technology. Monthly film shows will be held in Birmingham throughout this winter. The first show will take place in the middle of November. In the future the Group intends to produce original films and photographs.

Members of the Scientific Film

Group are provided with all the facilities described above, including admission to the film show. Annual membership fees are as follows: Full members of the Association of Scientific Workers, 10s. 6d.; Associate and Student Members, 6s.; non-members of the Association, 17s. 6d.; members of the public, including Association members, who wish merely to attend the film shows will be admitted at the rate of 1s. 6d. per show, while tickets granting admission to the whole set of five shows will be supplied for 6s. 6d. All applications for membership and enquiries should be addressed to Mr. H. Zerkowsky, A.R.P.S., Rowney Green, near Alvechurch, Worcs.

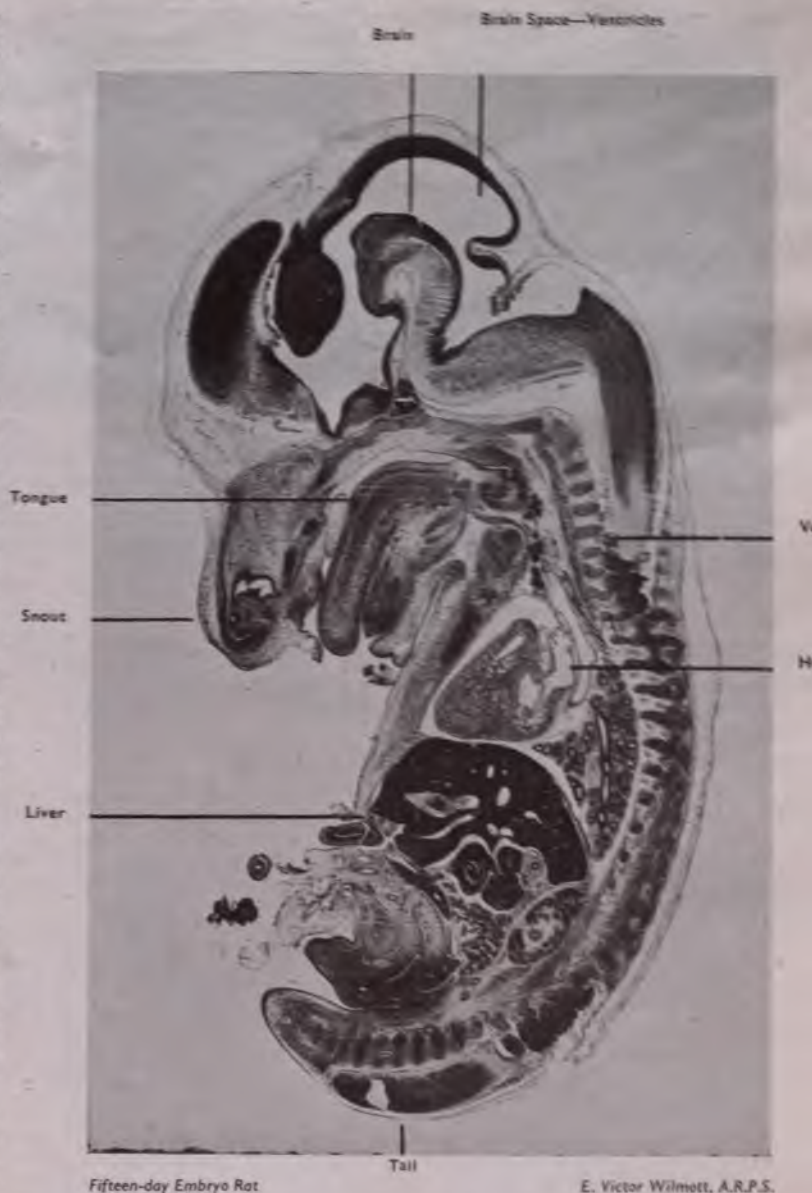
G. H. McLean is another exhibitor with a significant story to tell, and his exhibit, "Cereal Scab on Wheat," makes plain the nature of this parasitic infestation and demonstrates its disastrous effect on the yield of grain in the crops infected. Here, as in the examples previously referred to, it is merely a question of supplementing the actual pictures with a short explanatory text.

It is not as though a very elaborate commentary is always needed. For example, the photomicrograph by R. Sutherland Allen, showing the stem structure of Brazilian Liana by dark-field illumination, gains in interest and meaning on reference to a large dictionary, which informs us that a Liana is a climbing tropical plant with woody stems found in South American forests or Indian jungles. But why should visitors to exhibitions be supposed to carry large dictionaries around with them? Even if they did, it would be of little aid to them in establishing the identity of *Stenopteryx hirundinis* (shown in the first two exhibits in the room, by Treeby Bolton). This pair—and especially the macrophotograph showing the insect at twenty-five diameters in a natural environment—makes a very interesting and attractive study. But its interest to those of us who are not entomologists could so easily have been increased by a dozen words of formal introduction to *Stenopteryx hirundinis*.

The twelve photomicrographs of an embryo rat, by E. V. Willmott, ranging from complete sections at low power to sections of individual organs at comparatively high power, represent a very fine and accomplished piece of work, lacking nothing in technical quality or in presentation. Studies of starch granules of different kinds, made with a projection microscope, by John Nicol, provide an interesting use of photomicrography, with a topical application.

A good geological pot-pourri is provided by A. V. Weatherhead with a series of rock or mineral sections—in one exhibit including some representative fossil plants—and for a comprehensive exhibit of this sort it is reasonable to assume a certain acquaintance with the subject on the part of the visitor.

F. J. Pittcock contributes two exhibits of value. From the scientific aspect his set of high-power ($\times 2000$) photomicrographs of human blood illustrating variations in the different types of white corpuscles, exemplifies the service which the photomicrographer can render to the cause of medical science. From the photographic aspect, his demonstration of the use of variable-contrast printing



Fifteen-day Embryo Rat

E. Victor Willmott, A.R.P.S.

paper in obtaining the optimum result in photomicrographs depends on using a high-contrast image as basis and supplementing it with the minimum of soft printing to get requisite detail throughout the field.

The group of medical exhibits is very small. It includes notably a set of pictures of a radium therapy unit, together with a convincing record of the successful treatment of a case of cancer of the ear by X-ray therapy, coming from E. V. Willmott, of the British Post-Graduate Medical School. Four chest radiographs by

O. M. Alexander show the typical appearances of pneumonia and tuberculosis. A series of clinical photographs and radiographs of cases of gout, in the hands and feet, by Dr. L. B. Bourne, is out of the common and a striking enough demonstration of the horrible deformations and dislocations of the bony structure which can accompany this condition. Emphatically a condition to be avoided!

A small group of miscellaneous exhibits includes a striking example of successful instantaneous photo-

the subtractive image—corresponding to cyan, and resulting from the conversion of silver to ferric ferrocyanide can hardly be described as a blue-green at all, and although the magenta and yellow images are more nearly correct in hue, the latter is extremely opaque—a fault which is often disregarded, but which has a considerable adverse influence upon finished prints.

In brief, then, metallic toning will not provide a high degree of accuracy in colour reproduction, but when operated with suitable stripping material and under reasonably intelligent control, it can be used to produce prints extremely quickly.

Carbro and Carbon

It is a well-known fact that the Carbro process is used almost exclusively by the American colour photographers, whose work so many of us hold as a standard, while an adaptation of the process was used in this country to produce the Vivex prints which used to be our standard. Hence there is little room for doubting that the Carbro process, especially when operated with the latest types of improved tri-colour tissues, can be made to produce the very finest colour prints which are at present obtainable, and when we recall the steps of the Carbro process, we see that they conform reasonably closely to the specifications already outlined for an ideal printing process. Where, then, is the difficulty?

The principal difficulty centres around the all-important stage at which the silver images of the original bromide prints are employed together with a suitable bleaching solution (also known as a sensitiser) to provide the reaction products which return to the pigmented gelatine layer of the tissues to produce a reproduction of the original image in the form of insoluble gelatine. The chemistry of these reactions is not simple, but the composition of the bichromate-chromic acid-ferrocyanide bleach must be very carefully balanced, not only to produce consistent results, but to produce acceptable translations of the bromide images. The pH (that is the degree of acidity or alkalinity) of a Carbro bleach bath must be carefully maintained and reproduced at the same level, since while the solution must be acid in order to ensure that the bichromate attacks the metallic silver, too great an acid concentration results in a reduction of the tanning effect and a resultant loss of highlight areas during hot water development. It is not difficult to appreciate that the

bleach contained in the impregnated pigment paper begins to react with the silver contained in the bromide print immediately the two come into contact, and, consequently, unless the surface of the pigment paper is pressed into intimate contact with the surface of the print with an absolute minimum of delay, then some part of the reaction products from the bleached silver deposits will wander from the precise area in which they should operate to tan the gelatine of the tissue. A moment's consideration will show that the delicate highlights of the image are likely to suffer most from the faulty or delayed combination of tissue and print.

It is also realised now that the exact condition of the bromide prints themselves, especially their pH, has a considerable effect upon the quality of the Carbro image, and in order to thoroughly investigate and control such variables, a pH meter becomes almost essential.

Naturally mechanical squeegeeing devices have been designed for the simplification of the important job of combining tissue with print, and given such apparatus, together with meticulous attention to detail, there seems to be little doubt that Carbro (especially now that pigment papers which more nearly fulfil theoretical requirements as regards hue and transparency are obtainable) is the most worth-while process for the professional and the advanced amateur. The cost of operating the process, however, is rather high, since one set of bromide prints, one set of tri-colour tissues and two sheets of transfer paper are called for in the making of each colour print. It is true that some Carbro workers manage to extract two or more colour prints from a single set of bromides, but generally it is now accepted, at least in America, that the use of redeveloped images is unwise and unprofitable if reproducible results are desired. The expenditure of time on the process is also high, as the bromide prints must first be made, and then the Carbro images, the latter subsequently being combined by successive transfer on to a temporary support before being again transferred to the chosen final surface.

There is much to be said in favour of the tri-colour carbon process and the similar method known as Dufay Tissue, for both procedures offer particularly rapid means for making colour prints, while the excellent scale of gradation which can be obtained by the carbon process is only surpassed by platinum printing. The disadvantages of both

these processes are, firstly, that only contact printing is really practicable with bichromate sensitised layers; secondly, that it is necessary to use freshly sensitised pigment paper if standardisation is to be attained; thirdly, that there is no certain method of balancing a print by test exposures unless the test strips are processed to completion and transferred to paper, and, finally, the pigments contained in the tissues have differential filtering effects upon the blue and violet rays to which the sensitised gelatine is responsive and as a result the printing times for a well balanced set of negatives are not equal.

Duxochrome

Duxochrome falls naturally into the next position on the list of processes I propose to mention, since it represents an attempt to ally the advantages of pigmented gelatine relief materials to the simplicity of a normal developing procedure. Duxochrome films are coated with an unhardened gelatine emulsion which contains both sensitive silver salts and appropriate insoluble subtractive printing pigments, so that when a silver image is developed by means of a tanning developer such as pyrocatechin or pyrogallol, the gelatine *in situ* with the reduced silver is rendered insoluble, and a relief image containing metallic silver and pigmented gelatine may be obtained by the usual procedure of removing the still soluble emulsion with hot water.

Here, as in the carbon process, the short cut which seems to offer advantages, results in difficulty in ascertaining the exposure and development times to produce correct density and colour balance in the final colour print. The course of development of the silver images contained in the cyan and magenta emulsions is practically invisible under darkroom illumination, and is therefore best carried out by time and temperature, which is in turn made less convenient by the necessity of using rapidly oxidised developers for the formation of the relief image. Reproducing results of test strips on full-size sheets of film is certainly the principal difficulty of the Duxochrome process, and it is no doubt because of this difficulty that the sponsors of the process always stressed the importance of the alterations which it is possible to make after the print has been examined by the temporary superimposition of the three films upon a white base. It is claimed that any image which is thought to be too dense, may be reduced by treatment with very hot water; but quite

apart from the difficulty of deciding whether the proportional reduction of one or more of the components will result in an improvement, I have always found that the recommended method increases the contrast of the images by reducing the highlights more than the shadows, and that when the washing down water reaches the high temperature required, some degradation of colour occurs with the pigments used.

I have often thought that it is possible that a greater degree of consistency might be obtainable with the Duxochrome process if the silver-pigment films were to be processed by time and temperature in a non-tanning developer and subsequently treated with a tanning bleach in the manner generally employed with Wash-off Relief film.

Wash-off Relief (Imbibition)

The link between the Duxochrome and Wash-off Relief processes is to be found in the formation of a gelatine relief image *via* a developed silver image. Similarity then ceases, because it is the object of the Wash-off Relief process to provide a set of master reliefs or matrixes which can be dyed up in appropriate acid dye baths and used to transfer substantially all the dye contained in the reliefs to gelatine coated paper, repeatedly re-dyeing and transferring the dyes if a large number of colour prints is required from the original set of matrixes.

The production of the necessary set of matrixes on Wash-off Relief film offers no very serious difficulty, but when the reliefs are to be dyed up, the variable factors connected with the process begin to accumulate. It is well known, for instance, that the pH of the dye baths has a profound effect upon the contrast and density of the resultant dye images, and since the average worker has no means of accurately ascertaining the pH of his dyes, particularly after they have been used several times, he must resort to trial and error in order to obtain a set of dyed positives which will, when superimposed on a white surface, present an acceptable composite image. It will be exceptional if this desirable result is obtained upon first examination, and if it is not, some modification naturally becomes necessary. The difficulty of deciding what change or changes will result in improvement has already been stressed and need be amplified no further; instead, we will assume that reasonable colour balance has been attained—in which case transfer and registration must follow.

Most photographers are aware that

there is similarity of principle between the Wash-off Relief process and the Technicolor process of colour cinematography; the dyes from the matrix films in the case of Technicolor being transferred, of course, to blank 35 mm. gelatine coated film. That the results obtained by the paper print making process and the motion picture printing process are usually so very different when the principles involved seem to be so much alike, sometimes puzzles beginners and disappoints others. It is certainly only after one has experienced the difficulties involved in the single-handed registration of large dyed relief films that one begins to realise the true value for purposes of registration of the perforations which run down either side of the motion picture film.

The difficulties of registration which are characteristic of an imbibition process, therefore, constitute what is generally considered to be the main disadvantage of the Wash-off Relief process, although balancing the density and contrast of the component images by alteration of the concentration of acid in the dye baths can provide trouble which is almost as serious. On the credit side there is always the comforting fact that a great number of prints (not necessarily all alike) can be obtained from a single set of reliefs with no increase in cost beyond that of the transfer paper.

Dye-Toning

We now come to dye-toning or dye-mordanting. The only process of this type which has ever been generally used seems to be Uva-chrome, and that, I believe, was used principally to produce transparencies. Briefly, dye-toning entails the conversion of a silver image into a compound such as copper ferrocyanide, copper thiocyanate, or silver iodide, which will serve as a mordant for basic dyes (e.g., auramine, rhodamine and methylene blue). When the conversion to the chosen mordant is complete, the image is immersed in a bath of the appropriate dye, where not only the mordant image, but the gelatine layer containing it will be dyed up. The dye attached to the gelatine is only held temporarily, however, and thorough washing in running water is generally sufficient to completely remove all colour from non-image areas, while prolonged washing will not materially affect the dye attached to the mordant image.

It might be thought that three separation positive images which had been mordanted, treated in appropriate dye baths, and washed clean,

could simply be assembled in accurate superimposition on a paper base to produce a satisfactory colour print, but it is an unfortunate fact that all the mordants which effect an accurate translation of silver into dye, are also much too opaque to provide satisfactory colour prints by superimposition. It is true that mordant images can be produced in an almost completely transparent form, but they then have greatly increased dye absorption characteristics and necessitate the use of extremely low density positives if normal density is to result in the toned images.

Fortunately, there are solutions to the opaque mordant problem, for if means can be found to fix or precipitate the dye which is originally attached to the mordant image, on to the surrounding gelatine, it then becomes possible to remove the mordant itself, for instance, by dissolving it in hypo, without causing the release and consequent bleeding of the dye. Tannic and other more complex acids may be successfully used for this purpose. Precipitating or laking the dyes in such a manner offers one further advantage in that it increases their fastness to light, which, in the case of most basic dyestuffs, is normally not very great. A disadvantage is that it also generally changes their hue to some extent, and, consequently, all tests which are intended to indicate the suitability of the absorption characteristics of the dyes for subtractive printing, must be made after they have been laked.

Rendering the dye images transparent does not represent a complete solution of the problems connected with dye-toning; for instance, dyes which are chosen for their satisfactory colour qualities, may not, in fact they will not, behave equally well in the way they wash out of gelatine, or at best they must be used in widely different but precisely controlled concentrations to provide balanced prints. Again, the mordant bleach must be compounded and maintained so that no intensification or reduction of density occurs upon conversion of the silver image to one of dye.

Nevertheless, I am able to speak with some confidence on the dye-toning process, since I have been using Tri-Tone regularly for the past four years, and I am of the opinion that when all the facts are considered, it provides the most satisfactory method of making colour prints. The principal difficulty connected with the process as it is now operated, lies in the transfer of the original positive bromide images on to

temporary celluloid supports for bleaching and toning before finally transferring to a common final support; in addition to the delay, considerable practice is required in these operations.

Colour Development

The last procedure I shall mention, has not yet been organised into a standard procedure for colour print-making, but there is no doubt that the principles of colour development or dye coupling, originally made popular by Kodachrome, offer attractive possibilities at first sight for the solution of almost all our colour printing problems. What could be simpler than the simultaneous development of a normal silver image and a subtractive coloured dye image on a stripping paper of the Chromatone type from which the metallic silver could subsequently be removed to leave the plain dye image ready for combining with the others of a set to form a colour print? That seems to be the line of reasoning taken by a large number of enthusiastic colour workers at the moment, and it is perhaps too early to be emphatic regarding the results of their reasoning.

It is a fact, however, that the scheme does not work out simply in practice. In the first place, it seems reasonably certain that the colour formers which are used to produce the subtractive elements in Kodachrome film, for example, are not generally available, while those formers which can be obtained produce only poor approximations of the required printing colours. Secondly, there are several difficulties connected with the practical application of colour-forming developers, which generally include a developing agent such as diethyl-paraphenylenediamine hydrochloride and a colour former such as par-nitrobenzyl-cyanide for magenta, 2,4 dichlor alphanaphthol for blue-green and acetoacet 2,5 dichloranilide for yellow. In all cases the mixed developer oxidises rapidly, and must therefore only be prepared immediately prior to use, and then can only be employed for one print. Some positive materials are much more suitable than others for purposes of colour development, but in all cases it is important to keep the images in a neutral or slightly alkaline condition, since the dyes which are formed are readily soluble in solutions such as acid hypo.

Balancing the density of the subtractive images is another very real difficulty encountered in colour development, since the formation of colour

is by no means equal with all the couplers.

The simplicity of the procedure is, of course, unquestionable, and if and when greatly improved subtractive colours become obtainable by dye coupling, there will be every reason for working towards the solution of the remaining lesser problems, but until then, as you will see from the specimen prints, there is little reason to expect more than mediocre results.

And now that I have drawn my picture of the field of colour print-making, I feel that something must be added to prevent the discouragement of any who may be contemplating work in this branch of photography; and I will simply say this—despite the innumerable difficulties I have been at pains to describe this afternoon, I really believe that according to our individual attitude towards photography, it is possible that even a poor colour print may give more satisfaction to the one who has made it than could the most universally approved composition in monochrome. In any case, all that I have said must be weighed against the fact that when we set out to produce photographic reproduction on paper of form and colour, we are attacking the wider task of photography, one which the earliest workers saw so clearly, but which we have still not yet solved.

In other words—please don't let me stop you!

Discussion

The CHAIRMAN (Mr. F. J. Tritton) said that all the members would appreciate the large amount of work which had been put into this paper. All of them were aware of these six processes, but they had not all had the opportunity which Mr. Coote had had of operating them, and to have produced prints by so large a number of different processes was certainly a sign of great versatility. Most of them considered themselves fortunate if they could master one of them.

Mr. J. R. NEWMAN asked whether Mr. Coote did not agree that in making colour prints, a great deal depended upon the quality of the separation negatives, and that in a perfectly balanced one-shot camera it should be possible to obtain negatives which required a 1 : 1 : 1 ratio of printing.

Mr. COOTE replied by saying that he agreed that more than half the colour print-making battle depended upon satisfactory negatives, although variations in the quality of illumination made it practically impossible to obtain perfect exposure balance under all conditions.

Mr. HINDE asked whether it was necessary to lay such stress on the perfection of the negative. He rather thought that the perfect negative as a precedent to the perfect print had been over-emphasised. He had been surprised, having to make prints from negatives which were far from perfect, at the excellence of the results. It was possible to get a colour print of reasonable quality from such negatives, whereas he used to feel that it was almost useless to try to make a colour print unless the negatives were more or less perfect.

The CHAIRMAN said that good negatives were certainly the starting point in colour printing.

Mr. J. R. NEWMAN said that it was much simpler to start off with perfect negatives.

Mr. COOTE said that anyone who produced a perfect balanced step wedge in his negatives had gone a long way towards the production of the perfect colour print.

The CHAIRMAN said that however perfect the apparatus and materials might be, the chances of getting perfectly balanced negatives were extremely small because of the light variations. The condition of the light in which the photograph was taken had to be considered, and it seemed to be a psychological fact that when a print was exhibited those who saw it did not take full account of what the lighting was at the time. They had always an idealised view of the lighting conditions.

Mr. J. R. NEWMAN asked why there should be so much difference between the various colour filters.

Mr. TRITTON replied that he did not think there was much difference. It had surprised him that there was not more difference than in fact obtained. At least three important researches had been done on the subject of the perfect colour filter, and all had arrived at slightly different results.

Mr. NEWMAN said that, theoretically, the dyes should be complementary to the printing colours.

The CHAIRMAN said that the big problem was that, taking the carbon process, the necessary pigments exactly matching colours did not exist, and the closest approximation possible had to be used. Dyes were a little more successful than pigments; with these one could get a little nearer to the theoretical value, but even so, they were not nearly perfect when examined critically, and until nature provided better pigments they were rather prevented from reaching their ideal in this respect. The eye was a variable factor, too. Therefore there was not a definite theory or practice as to what the colours should be, and it

was difficult to say what was theoretically correct. As far as he knew, the Wratten filters got as near to the filters suggested by Dr. Mees, in his classical work, as it was possible to do at present, but he did not think it theoretically correct to say that they should be matched to the emulsions. Practically this would be difficult, because emulsion manufacture was changing so rapidly and they hoped it would go on changing and improving.

Mr. MILNER said that one interesting point was that the hue of a Carbro tissue changed considerably according to the different making-up

of the "A" and "B" baths. He had not actually followed it out, but some of the reactions he had found, especially on step wedge trials, were interesting. One batch was magenta and the other distinctly orange red.

The CHAIRMAN said that he was interested to hear what Mr. Milner had just said, and he thought the manufacturers would be interested too.

A MEMBER said that certain experiments had been carried out with alternatives to celluloid in the shape of certain plastic substances, and they had the definite advantage that there was no necessity to wax the base or treat it in any way.

Another MEMBER said that there was a material called "distrene," which could be used on the celluloid. It seemed to stick to the celluloid reasonably well. He thought the mechanism of the wax must be that it formed a surface on the celluloid impervious to water.

The CHAIRMAN moved a vote of thanks to Mr. Coote for his illuminating paper, and for the prints which he had shown. He hoped that it would be possible to publish the paper, so that it could be studied with greater advantage, and its conclusions could then be compared with their own in the working out of these processes.

PREPARING THE SCRIPT

By Adrian Brunel, A.R.P.S.

At an informal meeting of the Kinematograph Section of The Royal Photographic Society, held on June 9th, 1943, with Mr. A. W. Watkins, A.M.I.E.E., A.R.P.S., Director of Recording at Denham Studios, in the chair, Mr. Adrian Brunel gave an address on "Preparing the Script."

The Chairman, in introducing Mr. Brunel, said that he knew him very well indeed, as he had worked with him for a number of years and had first-hand experience of his ability and knowledge and of the contributions he had made to the industry with which they were associated. Mr. Brunel was one of the directors responsible for the first of the British propaganda films, "The Lion has Wings," and was associated with Mr. Leslie Howard in the production of two of the most outstanding of recent pictures, "The First of the Few," and "The Gentle Sex."

Mr. Adrian Brunel then read his paper.

I HAVE—directly and personally—instructed many script writers in their craft, and there are three well-known scenarists whom I have trained for the job by the inverted method of teaching them to cut film first.

One of these I had working for me on the re-editing of a seven-reel Continental picture, which I was preparing for the British market. When he had finished the job, I created another one for him.

"I want you," I said, "to wind each reel of film from beginning to end, noting every camera change or join in the film. Give each one a serial number, write down the camera distance precisely—such as 'long shot,' 'medium long shot,' 'medium shot,' 'close medium shot,' 'close-up,' and so on—and also record what the camera does, if it is not static. That is to say, if it pans, or tilts, or tracks. Describe the background and give an exact account of the action."

My friend did this—extraordinarily well—using at least 300 sheets of paper. We then had his continuity typed. When he saw it, he exclaimed, "Why, it's just like a script!"

"Precisely! That's just what I

was aiming at," I answered pompously. "You have written out a script—in reverse. These descriptions of scenes mean something to you in terms of strips of film. And now, here is the story of a film I am to make. I want you to see if you can write me a technically reliable and well-visualised script of the first sequence."

And he did. I've never known a novice tumble so quickly. He had got the hang of the technical requirements more fully and reliably than any beginner I have ever known. And what makes it even more remarkable is that he had no studio experience, although he had occasionally watched me shooting.

And so I suggest to you, that as a first exercise in script writing, you should do the same—even if you already have some experience of scripting. Get hold of a copy of any film you think is well made, and make a continuity of it—taking care to record the camera positions and movements accurately.

Now let me start at the very beginning, with the all-important question of the choice of subject.

It has been said that so far this

war has not yet produced any great works of art that have been inspired by the war—such as the play "Journey's End," the book, "All Quiet on the Western Front," and the paintings of Nevins and Nash in the last war. This may be true, but although we have produced some very banal and obvious films, we have also produced some outstanding work—mainly of a documentary nature.

Let me give an illustration of the sort of film I have in mind, as being a fine work that was directly inspired by the war. I think it can serve as a useful pointer to us. A documentary short was produced by the Crown Film Unit last year, entitled "Listen to Britain." Not being a Service film pure and simple, our unimaginative authorities did not give it the boost they gave to "Target for To-night," for example, but it was, nonetheless, a great picture, and will probably be more worth looking at in years to come than the excellent "Target for To-night."

Admittedly the treatment of the subject was superlatively good, but the basic idea is just the sort of thing we should be looking for. It was very simple—just a record, in picture and

sound, of the sounds we hear in war time—guns, marching feet, lorries, aeroplanes, trains, factory workers, machines, radios, National Gallery concerts, and so on.

It is *possible* that you could think up interesting angles of approach to, say, the Home Guard, Fire Services and such-like subjects, and you *could* devise around these subjects very useful and worth-while films with an original approach—but these are the obvious subjects which we all of us think of first. There are ten times as many less obvious subjects to be dealt with by film makers—of the same class as this picture of the sounds of Britain in war time.

It will be worth a lot to you if you can browse along these lines and find unusual subjects or uncommon approaches to not too hackneyed subjects.

Don't accept the dictum that there is nothing original under the sun. There is—there are heaps of original angles of approach and innumerable unexploited subjects.

Take this meeting. Take it as an example of war-time England. Take it as an incident in a film and add to it scenes of other meetings—some of a political nature and others of a religious flavour—there's plenty of fun and relief in these two classes of meetings. Take Council Meetings, Committee Meetings, Race Meetings, Football, Cricket and Boxing Matches. There is no end to them.

Then, attach to this recording of a variety of war-time meetings a theme—such as the Freedom of Speech and Action, the Importance of Fanatics and Fans, the worthy earnestness of our fellow countrymen—what you will, and there you have the basis of a film.

If you want to jog your imagination, get hold of some of the reports of *Mass Observation*. In case some of you don't know the function of *Mass Observation*, I would say that it operates somewhat similarly to the Gallup Poll. Its reports are much fuller than the résumés one sees of the Gallup Polls, and it gives details of people's individual reactions to scores of war-time subjects and occurrences. In case it sounds dully statistical, I can assure it isn't. It really is a most useful and stimulating document.

Mass Observation is full of potential film material of a worth-while nature, and I am sure that we can all get additional satisfaction from our work if we choose *worth-while* subjects. If you confine yourself to such subjects, you don't confine your field of choice; indeed, I think it could be argued that you widen it. Doubtless most of you *would naturally* make such a choice;

but there are many people who justify their selection of trivial farces with the argument that the public needs amusing and that a good laugh is a necessary tonic. That is undoubtedly true, but there is no reason why one should select a trivial farce. If you have a gift for comedy, there's plenty of room for it in the treatment of what I call worth-while subjects. Indeed, I can imagine many a good comedy that can have a worth-while theme. Chaplin's "The Great Dictator," for example. I am now writing a play that is a comedy of life in a household where four or five people have been billeted; it is the type of subject that offers scope for plenty of fun and a wholesome, unobtrusive moral.

And now a word in broad principle on Originality of Treatment. Take travel films. There is the FitzPatrick type of short—not much shape or form, just a quick look round at the advertised highspots—but mildly interesting, for FitzPatrick travels far and industriously—but his films are never more than just *mildly* interesting, because he never stays anywhere long enough to see more than the obvious.

Nearly all travel films are somewhat of the FitzPatrick type of a quick look round at the guide book stuff. Some go a bit deeper, but they are usually formless—except that they are meticulously chronological and static geographically.

Once upon a time a real film creator was employed to make a picture of a world travel for a shipping company, and he did something original. It was the German, Walther Ruttmann, who took a film for the Harpag Company, which he called "Weltmelodie" (World Melody).

When he had got all his material developed and printed, he then set out on the greater adventure—assembling his mass of material in a manner that had not before, and has not since, been attempted.

He did *not* assemble his film chronologically or geographically. He did *not* put all the shots taken in China together, and then proceed to the Land of the Geishas. He mixed the countries all together. He planned his film as a review of mankind—getting up in the morning, exercising, washing, feeding and going to work. We saw the world at work and at play and eating and at Church, ending up with the world going to bed.

It was very much the same technique that Ruttmann had employed in his famous film "Berlin," and I cannot help thinking that it must have been designed thus from the first, and was not just an inspiration from the cutting room.

Now if he had assembled his film in conventional, chronological and geographical order, you would certainly have got a good idea of a world cruise and you would have had attractive periods in many lands. But you wouldn't have got the stimulating effect that the juxtaposition of say the following shots gave:

- (a) A religious procession in Portugal.
- (b) A religious procession in Japan.
- (c) A similar parade amongst some cannibal tribes.
- (d) A Moslem procession in Cairo, carrying the sacred carpet.
- (e) An Easter procession from St. Peter's.
- (f) A Salvation Army procession in Wales.
- (g) A religious performance by Dervishes.

The effect of such shots, taking only a few minutes to run, is more illuminating than a whole volume on Comparative Religion. Watch the faces of the fanatics, and of the perfunctory functionaries of these various faiths, and it sets you thinking.

Mr. Brunel then proceeded to deal with the choice of subject and the treatment of the chosen subject, as a joint problem. He gave a number of "Do's" and "Don't's," and summed up with "Don't—at first—attempt too many clever tricks and subtle touches. To begin with, aim at simplicity, sincerity and clarity. In short, learn to walk well before you attempt to run." Mr. Brunel then gave illustrations of how certain film makers who had good ideas had failed owing to their not having then mastered their craft and realised the limits of all their resources; but he stressed that nonetheless "new ideas, new angles, new treatments are precious . . . they are the lifeblood of progress in our craft, and should be one of our principal aims."

Mr. Brunel next dealt with the precise meaning of technical words and phrases employed in the writing of treatment and script. "Sequences" he compared with the chapter divisions of a novel, and explained how they were governed by three principal considerations:—

1. *Time*: A sequence can be all those scenes or shots which represent a *continuous* period of time. When there is a break in such a block of consecutive action—that is to say, when you have come to the end of a continuous series of consecutive shots and then have to take up your action five minutes or five years later, you fade out the first sequence and fade in to the next. Suppose you have a series of shots, showing a number of aeroplane

parts being packed and dispatched from a factory; then you show these planes being unpacked at an aerodrome. These would be two different *sequences*; you would fade out from the first and fade into the second (or dissolve).

2. *Geography*: A sequence can be governed by geography as well as time. For instance, (a) you may have scenes of Hitler's coming to power, his elimination of the Left Wing opposition, his being supported by the Big Shots of Heavy Industry, his secret, and then open, re-arming, and so on. Then you show in another group of scenes what was happening in England at that time (if you can bear to)—how some of our so-called patriots were praising Hitler and lending him money, how Churchill's persistent warnings were even resented, and so on. Well, those two groups of scenes would be different sequences, governed by geography, rather than by time.

3. *Subjects*: In a documentary film, for instance, you can have groups of shots belonging to a certain subject, or aspects of a subject, followed by another sequence of scenes dealing with something else. Suppose you are doing a film on Education. You are recounting the methods of teaching history, to be followed by a section dealing with French language teaching. These two groups would be separate and compact sequences, governed by the difference of subject.

On the importance of the treatment, Mr. Brunel said: An advantage of writing a treatment before you embark upon your full and detailed shooting script, is that you have the opportunity of *sketching in* scenes, sequences, those clever touches and those brilliant ideas, without the possibly fruitless labour of writing them up fully. The treatment is a good testing ground for new ideas. You can try them out on your friends, discuss them, and then, if they remain in your final treatment, they may be worth survival in the final script. . . .

Don't spare yourself on this phase, I beg of you. Believe me, once the treatment is right, the script will be relatively easy; the script will give you plenty of opportunity for concentration and application, but with a cast-iron treatment you will be encouraged, and many of your doubts will be eliminated. It is an economy of time and labour to do your damndest on the treatment.

And now we come to the scenario or shooting script, the final, technical

transcription and elaboration of your treatment.

It is of the utmost importance if you want everyone concerned to understand how you visualise the picture about to be shot—that you and your associates should master the technical jargon of our craft and that you should all use the same words for the same things.

First of all, the movements of the camera. The camera pans, tilts or tracks. It *pans* in a horizontal movement—to the right or the left. It isn't essential to say if this movement is to the right or the left, but if you have a sketch of the set or location, or else a very clear impression of the whole scene, together with its surroundings as well as its background, you will know well enough if you are going to pan to the right or to the left. In such cases, you may as well say which it is. It is possible that you may avoid being at cross purposes with others if you have set this out exactly.

Now the camera doesn't *pan* up or down, in a perpendicular movement—it *tilts*. Most cameramen use the word pan for tilt, and I have more than once misunderstood what my cameraman was suggesting, because he used the wrong term.

Finally, when the camera moves on wheels, it *tracks*. There is another word for this—*dolly*—but forget it. The camera tracks forwards, backwards, to the right, to the left—and diagonally. A perfect technical script will say precisely which it does. And one more thing—the camera may, in one shot, do more than one of these things or all of them.

Reverting to the importance of using precise and accurate technical terms, Mr. Brunel described in detail the eight "camera positions," and explained the proper usage of the expressions, "Fade In," "Fade Out," "Iris In," "Iris Out," and "Dissolve." "I think these are all the technical words and phrases that must be in the script-writer's vocabulary—only about twenty in all, which doesn't seem much to ask of a writer to understand and use correctly. But too many of them shirk this little drudgery."

Good continuity Mr. Brunel described as "that quality in a script where the action is smooth and easy-flowing, and there are no accidental jolts to one's attention or to the moods the film is intended to create in its audiences." Mr. Brunel gave examples of continuity links to assist the easy transition from one sequence to another, and dealt with the question of the *shape* of one's film. "I have mentioned Ruttmann's 'Berlin.' This had a very definite shape. It showed

us one day's life of Berlin, and had a chronological shape. It began quietly, drowsily, as the early workers rose and set forth, the others following in a rising crescendo. And so on throughout the day and night. The whole film had a definite shape and each sequence had its pattern.

The shape of your film can vary, from sequence to sequence, and, of course, it need not only be chronological. It can be just logical, for instance. You set out to state a case—on nutrition, murder, pacifism, militarism, the Beveridge Report, slum clearance, physical culture, education, or whatever your subject may be. Your treatment, your mode of approach and manner of expounding your subject, should have a design. It will vary considerably, of course, according to the subject, the length of the proposed film and so on, and one cannot lay down hard and fast rules—to be broken. Three independent units of intelligent craftsmen given the advocacy of the Beveridge Report as a subject, would, we hope, all set about it very differently. But the point is, your film should have a conscious plan.

And this applies with equal force to dramatic subjects. From Dumas to William Archer, the great theorists on the art of play construction have all driven this home.

William Archer, in his book, "Play-making," has given us the greatest number of sound, helpful and usually irrefutable maxims.

Dumas said that your play should have a beginning, a middle and an end. This is often quoted, and I suppose it is profound. But it surely needs elaboration. Maybe he did elaborate it. Perhaps he said—

The Beginning—it should be clear, and rather more explicit than after you have captured the attention of your audience. And that you must do—you must intrigue them. The Beginning must introduce your characters to your audience, and it must set out your theme and your situation.

The Middle—it must be interesting, you are building up to your climax, you have built up the situation, the theme and the characterisation in the beginning, so in the middle you must advance it, you can foreshadow your denouement in the middle, but you must not forestall it.

And the End—it will contain the climax and the denouement. A word of warning is contained in the definition of the word "Climax" by that brilliant American cynic, Ambrose Bierce. "The Climax," he says, "is the period which immediately precedes the anticlimax."

So watch your end carefully. See that it is the end. Don't leave your

situation or your characters in mid-air. Don't peter out. And one more thing about the end. When once your end is in view, let your film gather momentum and go boldly for your objective.

And most of this advice about the beginning, the middle and the end applies just as much to a documentary as to a dramatic subject.

Professional companies have a maddening passion for that most valuable institution of their own creation—the Script Conference. On the whole I think I can say the script conferences are generally mismanaged, that too many people are invited, that many of those invited have not read the script, that the conferences take too long, and that they are literally a headache and a pain in the back.

Obviously it is important for, say, the art director and the cameraman to know what the film is about, what the author and the director have in mind, to give their views regarding their own work on the film, and generally to express intelligent criticism on work that is not in their own department. But I maintain that the procedure in regard to those technicians whose job is not primarily the preparation of the script, can be improved simply by:

1. Issuing them with a copy of the first edition of the treatment and asking them to report their views, and
2. Issuing them with a first edition of the shooting script and again asking for their views, and
3. Inviting them to the one and only general script conference, when the first edition is read, but if they don't want to come, don't insist. Only insist that they read the script and give their views.

And a final word on revision. It can cost you a lot of time and hard work and paper, but it will save you a lot of time in the shooting, hard work and celluloid.

My advice is to go through the treatment and the script again and again, improving your continuity, cutting out the drag, building up your sequences, studying the logic, considering the characterisation, seeing what is unnecessary, unattractive, inconsistent and so on. There are a score of such headings on which you can check your script in detail.

And now, before I close, I want to go back to the beginning, your choice of subject, not because it is part of a conscious pattern in my talk, but because I believe that, in these serious days particularly, subject is more important than technique.

I am not decrying the importance

of technique; I am the last to do that. Some impatient employers have an idea that we have developed our technique so that our jobs will seem more difficult and we can demand more money in consequence. Technique is *not* the invention of avaricious or conceited gentlemen who wish to appear clever or specially informed in an obscure and mystic art. Technique is the result of our study of audience reactions and, incidentally, as such, is worth money to the employer, who usually knows damn-all about the job.

A picture can be ruined by technical ignorance or laziness. It can also be made by these things. Nonetheless, an unworthy subject cannot be made worthy by technique, and the subject is still the biggest asset in a picture's success.

Mr. Brunel illustrated with two examples from his own experience. These personal experiences are a good illustration of the relative importance of story or subject, on the one hand, and technique on the other; and, incidentally, these two experiences reveal the inability of the panjandrum of Wardour Street to evaluate technical work. My work on the comparative failure was infinitely better than on the really successful picture.

If I were Dictator of the British Film Production business, I would detain all film financiers and producers, and put them in a nice, healthy, studio concentration camp, and make them learn the business of making films, before I let them loose again as film financiers or producers.

At the beginning of the war, as one of the patron saints of amateur film production, I was asked to issue a sort of encyclical to sub-standard workers.

Someone had said that "a hobby is a grand possession, strengthening our hold on the decencies of civilised life, which we must take forward to that better world we are determined to create when the war is over."

I agreed, but suggested that we should there and then utilise the hobby of film production in helping us to create this better world which we must be more determined about this time.

Our problems are already many, and others are cropping up daily, I said. But we are a democracy, wherein each one of us is free to point out our defects and to suggest their remedies. This is not the prerogative of the party politicians only, or if it has been, it must not remain so.

Shortly before the war J. B. Priestley declared that the times were so serious that writers had no business to engage themselves with useless trifles, and that everything they

wrote should be an application of gifts to the creation of a better and a safer world. He did not mean that we should cease to be entertaining, but that mere entertaining and nothing more was unworthy of a great calling.

I feel the same way about us film makers. We have a definite mission and we do not exist merely to drug our neighbours with unadulterated entertainment. Bernard Shaw is entertaining—hilariously, sometimes—but this great philosopher always has a purpose in what he writes. And so must we. We must hold our audiences, interest them, move them to sympathy, to laughter, to understanding, to activity—so that when our films have been shown, those who have seen them will have been stimulated, they will understand better something that needs our collective attention, and some of them, at least, will react in a way that will benefit humanity.

Discussion

The CHAIRMAN said he agreed with Mr. Brunel's remarks about script conferences; he had attended many, and it was impossible to sit down and really discuss a subject under the circumstances described.

He also agreed that treatment was really the kernel of the whole thing. Once a good treatment was secured, a good script should follow reasonably automatically. On the question of terms used in the industry, he, too, had been inconvenienced by the use of terms and expressions of which he had no knowledge. Immediately prior to the start of the war, the British Standards Institute were preparing a standard work dealing with this question of terminology, and called, he thought, a "Glossary of Terms Used in Motion Pictures," but the war had put a stop to this activity but he believed that it would be issued very soon after the war was over.

In opening the discussion, he would like to ask Mr. Brunel why he had avoided any reference to montage.

Mr. BRUNEL said that the study of montage had been rather a hobby of his, but it was very difficult to tackle in a script, and he had felt that in a talk of one-and-a-half hours he could not go into it. He was a great believer in montage treatment, and he had often done his montage himself, because he found that the script writer could not visualise it. Generally speaking, the script writer simply put the remark, "Scenes 139 to 173, montage," without making any attempt to think out or create that montage.

Mr. SCHOFIELD said the speaker had not mentioned dialogue and musical background. He wondered if he would say something about this, and perhaps elaborate by telling them what the script of "Fantasia" would look like: whether the music was primary and the picture secondary, as they rather assumed.

Mr. BRUNEL referred the question to Mr. WATKINS, who said that a picture of that kind had not so far been his good fortune, but he thought he could visualise its conception. He would first consult his musical director, who, together with the cartoonists, would be amongst the most important people in the construction of such a picture. Having arranged with the musical director the music which he thought most suitable to the subject he had in mind, the first thing to do then would be to record such music. The cartoonist's job would then be to make his sketches to accord with the music, and, no doubt, the script would show a considerable number of references to the type of action required in the form of "Close-ups," "Medium Shots," and "Long Shots," etc., with the appropriate dialogue.

Mr. BRUNEL agreed with that idea of preparing the script. He thought the question of dialogue definitely needed an evening's talk to itself. Just as theatre dialogue differed from novel dialogue, so film dialogue differed from stage dialogue.

A MEMBER did not think the question of music was important unless there was a definite reason for it. In one picture they had a man playing a piano, and when he came to a certain note it fired a gun. Except in circumstances such as those, the music was something which was usually added afterwards.

Mr. WATKINS agreed that in most cases the music was added afterwards but it must be borne in mind that even in the normal entertainment film the music was an essential part of the production, and it was necessary for the musical director to attend the script conferences. In some of the scripts with which he had worked the use and type of music was fully indicated, showing that it was an integral part of the picture.

Miss URQUARDT asked how closely the script writer followed the shooting of a picture.

Mr. BRUNEL said that it depended on his contract, and of how much he was capable. Sometimes he had been employed as a script writer at so much a week for the period of the production of the picture, and he had to attend the studio all the time to watch the picture, and remedy any problems in the dialogue which

occurred. Ideally, he thought it was a good idea for a script writer to be in attendance when a picture was being made, but it would be bad for him to do it year in and year out.

Mr. WATKINS thought he should, if possible, combine the two jobs of script writer and dialogue director.

Mr. BRUNEL agreed.

A MEMBER asked if the camera close-ups in a script really worked out, particularly where a documentary film was concerned. He thought the cameraman was the best man to select the positions for the camera.

Mr. BRUNEL agreed that where documentary work was concerned the cameraman was often the best judge, because there were fewer workers and less chance of confusion. His idea of eight camera distances had been evolved for the guidance of cameramen who were working with a mass of people all round them. It was the only way to obtain some sort of precision. But in documentary work he did not think it was necessary.

Mr. CHRISTOPHER BRUNEL said he was just starting to cut pictures, and was often overwhelmed by the admiration of other departments for the abilities of the cutter. Very often the directions given to them in a script were simply "montage," and it was left to the cutter to devise the montage. Therefore the impression was created that the cutter was a miracle worker. It was quite true that a terrific amount could be learned in the cutting room, but he thought a great deal could also be learned by going to see films time and time again. One of his colleagues had seen one picture seventeen times.

He also thought it was important to study the reactions of the audience and it was often interesting to see the different reactions to the same film in a West End London cinema and then in a local cinema in the suburbs.

Mr. BRUNEL agreed that scenario writers could learn a lot by studying the reactions of the audience. He also thought they dodged some of the hard work by leaving it to the cutter. It was the cutter's own fault to some extent, because he had usually been so good at the job and had enjoyed the superiority of feeling that he was the only one who could do a montage, and therefore the script writer was encouraged to leave it to him. He thought the division of labour should be redistributed now, and that the work of montage should be shared by the script writer.

Vote of Thanks

The CHAIRMAN in proposing a vote of thanks to the lecturer, said there was plenty of room in the film industry for people with brains and talent. It was still a very young industry, and it needed people with ideas. He wished to refer to one thing the speaker had said, though not in so many words, and that was that the majority of successful pictures had been made by allowing people to play their "hunches." (Mr. BRUNEL: "Yes.") If an intelligent person had a good idea for a picture, he should be allowed to carry it out with all the backing he required, and the chances were that the result would be extremely good.

The vote of thanks was accorded with hearty acclamation.

OUTING TO DENHAM

K.S. MEMBERS VISIT STUDIOS

THE visit of the Kinematograph Section to the Denham Studios on Saturday afternoon, August 6th, was a great success. It proved an almost inconveniently popular event, though Denham, which can assemble a thousand "extras" at need, had no difficulty in rising to the occasion, both in ensuring that its 200 visitors had an "eye-full," to use an Americanism, and in entertaining them in its very comfortable tea room. The members of the Section and their friends, headed by Dr. H. Baines, Vice-President of the Society, Mr. Percy W. Harris, Mr. Stanley Schofield and Mr. G. C. Weston, members of the Council, assembled at the main entrance, where Mr. Luscombe, him-

self a member of the Section, announced the programme for the afternoon. This included "shooting" on the floor, a visit to the grounds and exterior locations, a tour of the workshops, theatres, and sound department, and possibly a peep at the laboratory.

Then came a procession through seemingly endless corridors—for the studios occupy a fair space of Buckinghamshire—with their repeated signs enjoining silence, to a corner of the studios where a back-projection shot was being made. The film actors in a somewhat confined space conducted their dialogue in front of a window and through the window was a street scene, cleverly arranged by project-

ing on to a screen a film of a street with its various movement. In another part of the great building one watched the assembling of a set. Here was an elegant drawing-room, with white and gold panelling, tapestries, chandeliers, candelabra, rare old portraits, an ornate grand piano, vases with exquisite blooms, and period furniture. But the "ceiling" consisted of platforms and scaffolding on which batteries of incandescent lamps were arranged, and on the floor, with no thought of drawing room proprieties at all, the mobile camera went from one position to another, from long shot to close-ups and close-up to cross-angle, and the sound apparatus with its suspended and dejected-looking "mike" also made its appearance, and there were more lights and reflectors and black and white diffusing cloths. Moreover, there was a director who issued commands, which were no doubt intelligible enough to the actors and operators, but were wholly confusing to those who only looked on, and, just outside the range of the camera, there was a quiet young lady sitting at her typewriter—"the continuity girl."

Looking at such a scene one gained an immense new respect for the film actor. One wondered how he could possibly cultivate and sustain the absorption in his bit of drama when a fiercer light than ever beat on any throne is beating down on him, when he hears staccato directions and the cry of "Camera" is like to freeze his blood, when he has to work under restrictions as to space and time, to act within the field of view of the camera and the hectic seconds of exposure, to time his movements in accordance with the camera requirements, until the welcome word is heard at last, "All right. Print that. That will do."

Then out to the exterior locations, tripping over cables and every sort of obstruction, the two hundred Alices in Wonderland beheld all sorts of constructions which had no end and no beginning and were not what they seemed to be. One came, for example, upon a "life-size" ship, with three trim decks and a landing stage, complete down to the very name on the lifebelts hanging over the side. But it had no bow, no stern, no masts, no funnels, no engine room or stokehold. Here was a spire without a church below it. Here was a large house whose architects and builders had finished the lower part with the utmost detail and then, half way up the first floor, had apparently tired of the whole thing.

Two rows of cottage backs claimed

a great deal of interest. But they were only backs, there were no fronts. The window frames had been put in and the windows fitted with blinds and curtains. The drain-pipes, taps, and all the paraphernalia of the domestic backyard, including a bath-tub and the washing hanging out on the line, were in evidence, but it was only a façade. There was even a straggling growth of creeper over the wall and a few anæmic plants. But on the other side, where there was a similar row of backs, the gardens were in more profusion, and one was attracted in particular by a tree heavily laden with fruit blossom, until one touched it and found it to be artificial. The idea seemed to be that the camera might be turned in one direction to give a winter scene, and in the opposite direction to give a summer.

There was also a sheet of water with a large plain upright background so that, with the camera at a low angle, an impression was given of a wide stretch of sea, while toy models of submarines and, indeed, of an armada made it appear as though the British Navy was in action in a six foot depth of water. There were rocking machines also which could lash the quiet pool into such tempestuous waves as to induce a feeling of sea-sickness in the beholder.

After tea some of the party visited the laboratories where negative film from the camera is developed and hundreds of positive prints produced. They watched the making of the sample copy and the master print, and found the developing racks and tanks as impressive in their scientific completeness as any of the outside artifices. Out in the grounds, by the way, a Technicolor installation was observed, but the day was not bright enough for colour cinematography out of doors to be done to advantage.

Then a visit to one of the projection theatres where the first results are scrutinized with a microscopic eye so that mistakes may be corrected and re-takes made and captions written and re-written. One worker here who was concerned in the making of one of the most ambitious of British war pictures, "49th Parallel," a story of six Nazis who escape from a damaged submarine and try to make their way across Canada, told us of the nervous tension which continually beset him lest there should be some overlooked absurdity or anachronism in the construction, as, for example, the appearance of mountain ranges in what was supposed to be the flat Canadian prairie.

A glance was taken into the rooms where the films are cut and reassembled, also into the audition and rehearsal rooms, but to the disappointment especially of the ladies the make-up room appeared not to be open to inspection. The technique of the designing of sets was demonstrated. Denham is most fortunate in artists who can draw the perfect background and do it quickly, perhaps completing it in a day, in a manner suitable for the proposed picture and in the right perspective. The carpentry and other workshops were also visited.

The occasion was not one for instruction in technical details of large-scale film-making. Indeed, the crowd was so great as to make that impossible. It was a question of general impressions of a great film organization which will play a great role in British art and industry after the war. The visitors came away after expressing their warm thanks to the management and staff at Denham, to Mr. Luscombe, the chief guide, and to Mr. Schofield, the Hon. Secretary of the Section, for arranging a memorable afternoon.

PRE-WAR APPARATUS

A new edition of the excellent handbook published by the Photographic Dealers' Association last year. "Photographic and Cine Apparatus Pre-War Prices" has recently been issued.

This has been rendered necessary by the Board of Trade Order No. 393, which permits a higher second-hand price for a large range of popular goods.

The handbook contains the latest retail prices for new goods (as stipulated by the manufacturers), the Board of Trade Orders affecting the

price of photographic goods, and some useful explanations. It also contains a list of accessories which are price regulated.

When we received the original edition we had occasion to commend the Association and its Secretary, Mr. E. J. Andrews, for the efficiency of the compilation, which made it most convenient for consultation. This feature is again conspicuous in the revised second edition.

The sale of the handbook is now confined exclusively to members of the Photographic Dealers' Association.

G. H. McLean is another exhibitor with a significant story to tell, and his exhibit, "Cereal Scab on Wheat," makes plain the nature of this parasitic infestation and demonstrates its disastrous effect on the yield of grain in the crops infected. Here, as in the examples previously referred to, it is merely a question of supplementing the actual pictures with a short explanatory text.

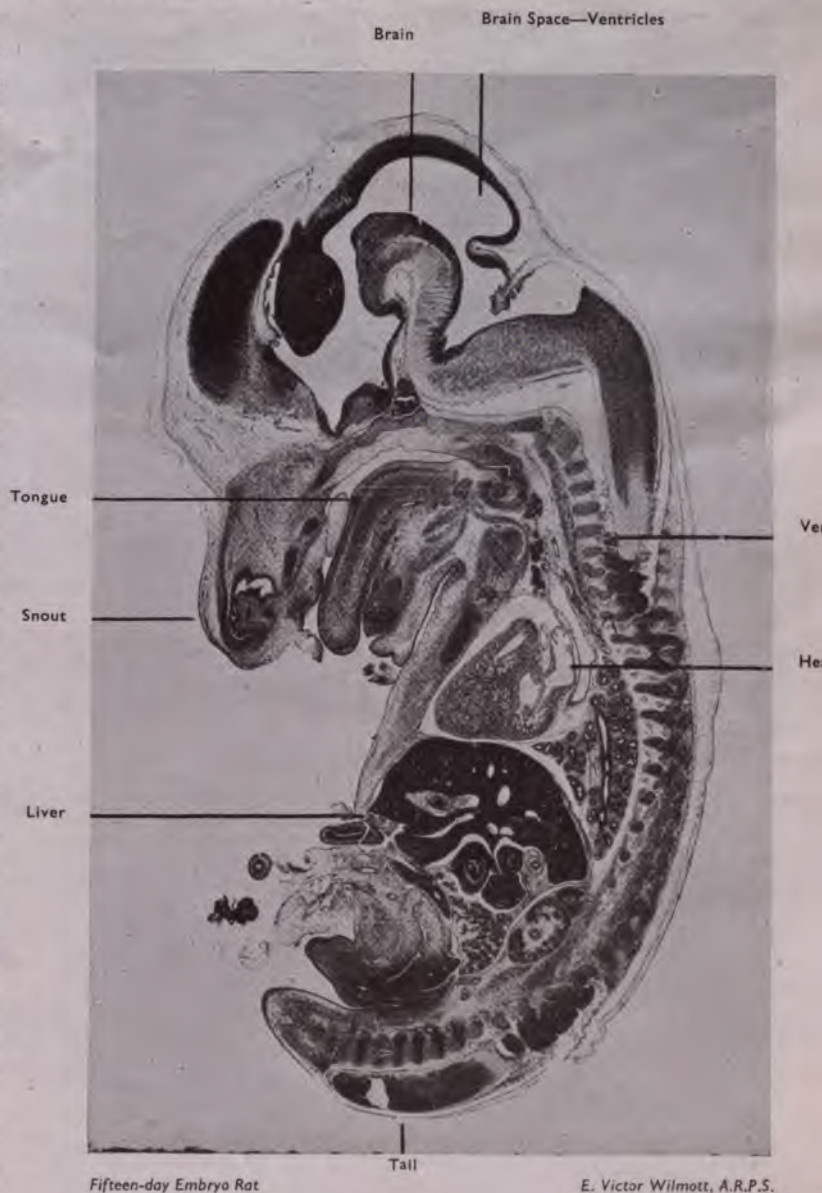
It is not as though a very elaborate commentary is always needed. For example, the photomicrograph by R. Sutherland Allen, showing the stem structure of Brazilian Liana by dark-field illumination, gains in interest and meaning on reference to a large dictionary, which informs us that a Liana is a climbing tropical plant with woody stems found in South American forests or Indian jungles. But why should visitors to exhibitions be supposed to carry large dictionaries around with them? Even if they did, it would be of little aid to them in establishing the identity of *Stenopteryx hirundinis* (shown in the first two exhibits in the room, by Treeby Bolton). This pair—and especially the macrophotograph showing the insect at twenty-five diameters in a natural environment—makes a very interesting and attractive study. But its interest to those of us who are not entomologists could so easily have been increased by a dozen words of formal introduction to *Stenopteryx hirundinis*.

The twelve photomicrographs of an embryo rat, by E. V. Willmott, ranging from complete sections at low power to sections of individual organs at comparatively high power, represent a very fine and accomplished piece of work, lacking nothing in technical quality or in presentation.

Studies of starch granules of different kinds, made with a projection microscope, by John Nicol, provide an interesting use of photomicrography, with a topical application.

A good geological pot-pourri is provided by A. V. Weatherhead with a series of rock or mineral sections—in one exhibit including some representative fossil plants—and for a comprehensive exhibit of this sort it is reasonable to assume a certain acquaintance with the subject on the part of the visitor.

F. J. Pittcock contributes two exhibits of value. From the scientific aspect his set of high-power ($\times 2000$) photomicrographs of human blood illustrating variations in the different types of white corpuscles, exemplifies the service which the photomicrographer can render to the cause of medical science. From the photographic aspect, his demonstration of the use of variable-contrast printing



Fifteen-day Embryo Rat

E. Victor Willmott, A.R.P.S.

paper in obtaining the optimum result in photomicrographs depends on using a high-contrast image as basis and supplementing it with the minimum of soft printing to get requisite detail throughout the field.

The group of medical exhibits is very small. It includes notably a set of pictures of a radium therapy unit, together with a convincing record of the successful treatment of a case of cancer of the ear by X-ray therapy, coming from E. V. Willmott, of the British Post-Graduate Medical School. Four chest radiographs by

O. M. Alexander show the typical appearances of pneumonia and tuberculosis. A series of clinical photographs and radiographs of cases of gout, in the hands and feet, by Dr. L. B. Bourne, is out of the common and a striking enough demonstration of the horrible deformations and dislocations of the bony structure which can accompany this condition. Emphatically a condition to be avoided!

A small group of miscellaneous exhibits includes a striking example of successful instantaneous photo-

to the catalogue, congratulated the club on the success of its efforts and commented on the merit of the work exhibited.

The opening ceremony on the Monday evening was performed by the President of The Royal Photographic Society, Mr. D. McMaster, who was supported by Mrs. Rosalind Maingot. Mr. McMaster brought greetings from the parent society, and, in his speech, congratulated the club on the elegant staging of the Exhibition and commented on the diversity of subject matter represented. The club were deeply conscious of the honour accorded to them by the visit of Mr. McMaster, and this was revealed by their enthusiasm at the meeting and their comments during the week.

Petersfield Photographic Society

Petersfield Photographic Society's second Exhibition since its formation in 1941 was held in August at Winter House, Petersfield, and was seen by nearly 2,000 visitors.

The Society's President, Mr. C. J. P. Cave, M.A., F.R.P.S., in opening the Exhibition, referred to the great strides photography was taking, particularly since the days when he did research work on X-rays under Sir James Ewing at Cambridge.

The Exhibition was judged by Mr. W. R. Kay, F.R.P.S., of Southampton Camera Club.

There were classes for members (intermediate and advanced) and open to Hampshire societies, from whom a good entry was received.

Premier awards in the members' classes were gained by E. G. Dove (intermediate), C. Fry, A.R.P.S., C. J. P. Cave, F.R.P.S., Miss B. Wagstaff, and in the open classes by C. A. White, M. R. Babbage, J. Milner, A.R.P.S.

There were some very fine examples of the work of Bertram Hutchings, F.R.P.S. (not for competition).

Admission to the Exhibition was free, but a box was placed in the hall for donations towards expenses. After payment of the latter, donations were made by the Society to The Red Cross Prisoners of War Fund, The British Sailors' Society, the Y.W.C.A. (Petersfield Branch), and the P.D.S.A. (Portsmouth Branch).

Pittsburg Salon

The 38th International Pittsburg Salon of Photographic Art will be held in the Art Gallery of the Carnegie Institute, Pittsburg, Pennsylvania, U.S.A., in March and April, 1944.

The last day for receiving prints is *February 18th*.

STALINGRAD HOSPITAL LABORATORY APPEAL

The Council of The Royal Photographic Society wish to draw the attention of members and readers to the following communication:—

STALINGRAD HOSPITAL LABORATORY FUND

C/o Association of Scientific Workers, 73, High Holborn, London, W.C.1

A fund is being raised in Britain to equip a hospital in Stalingrad, to express in a permanent form the British people's gratitude to the defenders of Stalingrad who have made such a great contribution to the final victory of the United Nations.

It seems to us appropriate that British scientists should equip the laboratory of this Hospital. We are, therefore, raising a fund for this purpose, and we ask your Society to

bring it to the notice of your members.

(Signed) E. V. Appleton, J. D. Bernal, Lawrence Bragg, Henry Dale, H. R. Dean, S. C. Dyke, H. J. Gough, J. B. S. Haldane, Horder, Donald Hunter, N. K. Johnson, F. Wood Jones, H. Spencer Jones, Moran, W. T. J. Morgan, R. A. S. Redmayne, E. J. Russell, John A. Ryle, A. F. Sladden, G. G. Turner, Robert Watson-Watt, Alfred Webb-Johnson, C. S. Wright.

Hon. Treasurers: Dr. Aleck Bourne and Dr. S. Masterman.

Donations should be sent to "Stalingrad Hospital Laboratory Fund," The Association of Scientific Workers, Hanover House, 73, High Holborn, London, W.C.1.

The entry form, properly filled in, together with an entry fee of one dollar, must be mailed to the secretary. This fee covers the entry of one to four prints from any one contributor.

Prints must not be mounted, and each picture must bear on the back, plainly written, its number, title, name of artist and return address, and the printing medium used. All prints accepted by the judges will be suitably mounted by the committee. The entire exhibition will be hung under glass.

Entries must be forwarded only by mail (as printed matter) marked "Photographs—no commercial value—for exhibition only—to be returned to sender." Do not send by express.

A postcard acknowledging receipt of pictures, and stating the number of prints accepted or rejected by the jury of selection will be mailed to each contributor about March 1st. After the opening of the Salon a catalogue will be mailed to each contributor.

Entry forms and all further information may be obtained from:—Simon Zecha, Secretary, Pittsburg Salon, 637, Chislett Street, Pittsburg (6), Pennsylvania, U.S.A.

Photographs of Islington

The Islington Public Libraries Committee, in view of the destruction of buildings which has taken place as a result of enemy action, and of the anticipated re-building which is likely to occur during the next fifty years, are desirous of obtaining photographs of buildings and street scenes depicting the borough during recent years.

The borough includes the communities of Highbury, part of Highgate, Tollington Park, Holloway, Tufnell Park, Barnsbury and Canonbury. Readers possessing such photographs or negatives from which prints could be made, should communicate with the Chief Librarian at the Central Library, 68, Holloway Road, N.7, describing the material available.

* * *

THE SOCIETY'S GROUPS

Groups for the special encouragement of (a) scientific and technical photography; (b) pictorial photography; (c) cinematography; (d) colour photography and (e) miniature camera photography are empowered under the Standing Orders to assist the Council in the work and aims of the Society.

The Honorary Secretaries of these Groups are as follows:—

Scientific and Technical Group: Dr. G. B. Harrison, F.R.P.S., Selo Physics Laboratory, Woodman Road, Brentwood, Essex.

Pictorial Group: J. Dudley Johnston, Hon. F.R.P.S., 16, Prince's Gate, S.W.7.

Kinematograph Section: Stanley Schofield, F.R.P.S., Sheridan, 4, Norwood Drive, North Harrow, Middlesex.

Colour Group: J. H. Coote, F.R.P.S., 11, Cavendish Avenue, St. John's Wood, N.W.8.

Miniature Camera Group: Col. W. Symon, A.R.P.S., 21, Draycott Place, S.W.3.

. P. S. PROCEEDINGS COUNCIL MEETINGS

MEETING of the Council of The Royal Photographic Society was held at 16, Prince's Gate, S.W.7, on Sept. 13th, 1943, when the following were present: The President, Mr. D. McMaster, in the chair; Messrs. Baines, G. Scott Bushe, L. V. Chilton, A. E. Dent, W. J. Foster, Fredson, Percy W. Harris, G. E. W. Herbert, J. D. Johnston, Mrs. Rosalind Ingot; Messrs. F. J. Mortimer, J. H. Pledge, Ronald Procter, Stanley Woffield, Thomas H. B. Scott, W. Symon, F. J. Tritton and G. C. Weston.

New Members

The following Candidates were nominated for membership:—

Ilford Able, 12, Hillington Gardens, Woodford Green, Essex.
E. Armistead, Lieut., U.S.N.R., 70, Grosvenor Street, W.1.
W. P. Baxter (Captain), 11th Sikh Regt., c/o Lloyds Bank, New Delhi, India.
James Henry Bell, F.L.C. 2132, R.C.A.F., Overseas, H.Q.20, Lincoln's Inn, W.C.2.
James Douglas Codrington Boyes, "Wimborne," Millfields, Nantwich, Cheshire.
Richard Milton Brown, American Embassy, London, W.1.
J. G. Briggs, "Khan Yunis," Wirksworth Road, Duffield, nr. Derby. (Member, Derby Photographic Society).
Harrell Catling, "Ashenden," Bradmore Way, Brookmans Park, Hatfield, Herts.
Charles Samuel Carter, Junr., 720, Euclid Avenue, Bristol, Virginia, U.S.A.
Kenneth Cornell, 2030, Clybourn Avenue, Burbank, California, U.S.A.
Theodore Frederic Darvas, 83, Clarewood Court, Seymour Place, W.1.
John Henry Davies, Red Gates, Cemetery Road, Porth, Rhondda.
Sidney John Davies, "Westholme," 20, Traillwm Road, Llynwendy, Llanelli.
Leonard Albert Elliott, 79, Evelyn Avenue, Rushlip, Middlesex. (Member, Photographic Miniature Postal Portfolio (Circle 2), Half Plate Club).
John Rossall Evans, 81, Polefield Road, Prestwich, Manchester. (Member Oldham Photographic Society).
Zwladys Vaughan Field (Mrs.), 60, Heathcroft, Hampstead Way, N.W.11.
Edgar Ronald Gardner, Stonehouse Farm, Gloucester Road, Tewkesbury.
Percy Geldard, 1, Woodcock Lane, Northfield, Birmingham. (Member, Birmingham Photographic Society).
Jeffrey Gordon Gurrin, L/Photographer, PMX 68144, No. 5 Mess, R.N. Air Station, Twatt, Orkney.
Ben Rudolph Hey, "Fairhaven," Cawley Lane, Heckmondwike, Yorks. (Member, Spen Valley Literary and Scientific Society).
William Hibbert, School House, T.R.E., Gt. Malvern, Worcestershire.
John Hill, "Charlwood," 108, Carshalton Road, Sutton, Surrey.
Ivy Louise Hinton (Miss), 2, Priory Avenue, Caversham, Reading.

George Tillstone Holford, Craddock, Cullompton, Devon.
William Robert Leonard Hosier, Swaylands, Amos Lane, Wednesfield, Staffs. (Member, Birmingham P.S. and Photographic Miniature Postal Portfolios).
Percy Hughes, 1, Hill Cliffe Road, Lower Walton, nr. Warrington.
Ifor Hywel Jones, Penrhiew, Neath Road, Tonna, Neath, Glamorganshire. (Member, Old Nisians (Neath) Photographic Society).
Paul Leo Jordan, The Bungalow, Victoria Road, Poulton-le-Fylde, Lancs.
Clarence William Jowett, Hillway, Tranmere Park, Guiseley, nr. Leeds. (Member, Bradford Camera Club).
William S. Kals, 933, West Georgia Street, Vancouver, B.C., Canada. (Member, Vancouver Photographic Society).
George Parmenter King, A.I.B.P., 43, London Road, Sevenoaks.
Wyndham Frederick LeStrange, 22, Adolphus Road, Finsbury Park, N.4.
Ivor E. Lewis, Windsor Studio, Windsor Road, Penarth, Glam.
Philip Barker Longson, 192, Bramhall Lane, Davenport, Stockport, Cheshire. (Member, Manchester Amateur Photographic Society, Stockport Photographic Society).
Frank Miller Mallinson, M.B., B.S., 74, London Road, Sittingbourne.
Alan Manning, 153, Hale End Road, Walthamstow, E.17. (Member, Tottenham Camera Club).
Ivan McCoy-Hill, 625, Upper Richmond Road, Richmond, Surrey. (Member, Richmond Camera Club).
Gordon Merkel, 1026½, Masselin Avenue, Los Angeles, California.
Walter Richard Midgley, "Alberta," Minter Road, Felpham, nr. Bognor Regis.
George Alfred Millidge, 43, Frensham Road, S.E.9. (Member, South Suburban P.S.).
John Cyril Mole Murray, 7, Uxendon Crescent, Preston Road, Wembley, Middlesex.
Roland Stewart Nettle, 16, Park Crescent, Rusholme, Manchester. (Member, Manchester Amateur Photographic Society).
John Oakes, 21, Bowling Avenue, Bradford Road, Wakefield.
Frederick Nelson Palmer, L.D.S. Eng., 12, Wickham Court Road, West Wickham, Kent. (Member, British Dental Association Photographic Society, South Suburban Photographic Society),

Tom Handford Parker, "Rose Bank," Manchester Road, Congleton, Cheshire.
Clifford Parkes, Waxlands, Halesowen, nr. Birmingham. (Member, Birmingham Photographic Society).
James Thomas Pearce, "Corwen," Station Road, Henley-in-Arden, nr. Birmingham. (Member, Galashiels Camera Club).
Richard Louis Percy, The Sanctuary, Cuckfield, Sussex.
Reginald Mossman Potterill-Tilney, 93, Parthenon Drive, Liverpool 11.
Leonard W. Powley, 29, Ridgeview Road, Whetstone, N.20. (Member, Barnet and Finchley Photographic Society).
Phillip George Reese, 31, Garden City, Rhymney, Monmouthshire. (Member, Bargoed and District Camera Club).
Leonard Mark Rigden, "Hacenda," View Road, Cliffwood, nr. Strood, Kent.
Dale C. Scholner (Major), 37, North Bradley Street, Indianapolis, U.S.A.
Frank Sefton, 1330, Sherbrooke Street West, Montreal, Canada.
Warner C. Simmons, PhoM2c, U.S.N.R., Building VV, Naval Air Station, Cape May, New Jersey, U.S.A.
Eric Richard Slesser, 56, Penshurst Gardens, Edgware, Middlesex.
George William Stanwix, 43, Bolton Road, Harrow, Middlesex. (Member, Kodak Works Photographic Society).
Henry Steinmark, 120, Leicester Road, Salford 7.
William Henry Grahame Stevens, 18, Northampton Street, Swindon, Wilts.
William Henry Teall, 35, Palgrave Avenue, Southall, Middlesex. (Member, Southall Photographic Society).
Edmond Teskey-King (Captain), 5, Cornwall Gardens, Brunswick Avenue, Hull.
C. D. Walkington (Major), 2 W.A.T.T.S., West African Forces.
Charles Norman Watts, 129, Daventry Road, Coventry. (Member, Coventry Photographic Society).
Gerald Robert Winkfield Wells, 31, Bath Road, Cowes, Isle of Wight.
Leslie James Wheeler, 4, Erne House, Rosebank Way, W.3. (Member, Kodak Works Photographic Society).
Buel White, Photo Dept., Post-Dispatch, St. Louis, Missouri, U.S.A.

JUNIOR MEMBERSHIP

Anthony Leo A'Hern, Station House, Cowley, Oxford.
Eric Charles Bailey, 69, Charrington Street, N.W.1.
Jack Bricklebank, 50, Grimesthorpe Road, Sheffield.
Albert Ewart Davis, 37, Dyfodwg Street, Treorchy, Rhondda, Glamorgan.
Henry Davison, 29, Sandringham Road, Sunderland.
Rowland Frederick Ebbetts, 58, Imperial Close, North Harrow, Middlesex.
Arthur Fretwell (Cpl.), Royal Engineers, C.O.X.E., Torridge House, Westward Ho, N. Devon.
Primrose Margaret Gravel (Miss), The Vicarage, Alderley Edge, Cheshire.

Alun Griffiths, 141, High Street, Treorchy, South Wales.

Charles William Heard, Corner House, Ashley Road, Thames Ditton.

Richard Sidney Howes, B.Met., 325, Ecclesall Road South, Sheffield 11. (Member, Sheffield Photographic Society).

Roland William James Humphries, 194, Floyer Road, Small Heath, Birmingham.

Thomas Molland, No. 1 Mass Miniature X-Ray Unit, R.A.M. College, S.W.1.

John Peter Neville, 12, Prospect Road, Leamington Spa.

Harry Wilfrid Pout, "Denlea," Heathview Road, Milford, Surrey.

Hugh Thomas Scignior, 10, Dormers Avenue, Southall, Middlesex.

Michael Heath Wassell, 26, Woodcote Road, Leamington Spa.

Laurence Raymond Whitman (Sgt.), R137940, R.A.F. Station, Ashbourne, Derbyshire.

The Candidates who were nominated at the meeting of the Council held on July 12th (see p. 318, August issue, this *Journal*) and the following Candidates were elected to Membership:—

Robert Sutherland Allen, 19, Woodlands Avenue, Worcester Park, Surrey.

Harold Vernon Barrett, 109, Holloway Road, N.7.

Ralph Sydney Beck, 31, Brookdene Avenue, Oxhey, Watford.

A. V. Bibbings, 4, Rowantree Road, Milber, Newton Abbot, Devon. (Member, Newton Abbot Photographic Society).

Seaford Brandy, Avelle, Pa., U.S.A.

Cecil Carosso Carlyon, "The Hermitage," Silver Street, Cambridge. (Member, Cambridge and District Photographic Society).

Edward Charles Clapham, 22, Market Place, Chalfont St. Peter, Bucks.

John Lawrence Cotterell (Capt. R.E.), 17, Penn House Avenue, Wolverhampton. (Member, Photographic Miniature Postal Portfolio).

James Dornan, c/o Timpany, 23, St. Cuthbert Street, Catrine, Ayrshire.

James Henderson Duncan, "Alvern," Cadley Causeway, Preston, Lancs.

Arthur Raymond Lionel Edmunds, 99, Shrewsbury Road, N.11.

Thomas Iwan Edwards, M.Sc., A.Inst.P., Pen Coedcae, Pontardawe, Swansea, Glamorgan-shire.

Marion Edith Erlanger (Miss), 88, Woodlands, N.W.11.

Edward William Forrest, 19, Park Road, Timperley, Cheshire. (Member, Manchester Film Unit).

Florence Mary Garland (Miss), "Millside," Thorney, Iver, Bucks.

G. R. G. Gates (Capt.), Sussex Lodge, Milverton Terrace, Leamington Spa, Warwick.

Frederick William Goodman, 28, Mount Park Road, Ealing, W.5. (Member, E.M.I. Camera Club).

John Ellis Broadbent Hayes, Meadfoot, Rosemary Hill Road, Little Aston, Sutton Coldfield. (Member, Sutton Coldfield Photographic Society).

S. W. R. Jackling, 6, Cooba Street, Canterbury, New Zealand.

Thomas Jones, 88, Warren Road, Erdington, Birmingham 22C. (Member, Kynoch Social and Recreation Club, Photographic Section).

Thomas Dempster Jones, "Bank House," Deinislen, Caernarvon, N. Wales.

Leslie Joseph King, Rosemere Hotel, Watergate Bay, Newquay.

John William George Kitchenham, 1, Minterne Road, Moordown, Bournemouth, Hants.

Gordon Whitlock Lane, 41, Stamford Avenue, Stivichall, Coventry. (Member, Half Plate Postal Club).

George William Lombardi, 77, Watermoor Road, Cirencester, Glos. (Member, Photographic Miniature Postal Portfolios).

David Macfarlane, The Hollins, Kirkby Lonsdale, Carnforth, Lancs. (Member, Kendal Photographic Society).

Walter Morgan, 9, Church Street, Treherbert, Glamorganshire.

Hugh Wynn Owen, LL.B., 36a, North Parade, Aberystwyth.

John Pilkington, Royal Naval Film Section, Tipney, Portsmouth.

Paul Kendall Pratte, 5741, Winona Avenue (9), St. Louis, Mo., U.S.A.

Douglas Alfred Reed, 4, Conway Street, Harchills, Leeds, 8. (Member, Leeds Camera Club).

Eric Hepworth Reid, 56, Courtfield Gardens, S.W.5. (Member, Liverpool Amateur Photographic Association).

Paul F. Ring, 1112, Center Drive, Richmond Heights, Missouri, U.S.A.

Frederick George Roker, Conway, 2, Parry Road, South Norwood, S.E.25.

Herbert Walter Sale, 6, Russell Road, Kensington, W.14.

Douglas M. Simmonds, 5, Addison Road, Bedford Park, W.4.

Geoffrey Meredith Singleton, c/o High Commissioner for Australia, Australia House, Strand, W.C.2.

Ernest Edward Slater, Winton Cottage, Taplow, near Maidenhead, Berks.

Alexander Smith, 92, Perth Road, Cowdenbeath, Fifeshire.

John Henry Leonard George Smith, 67, Upper Tollington Park, N.4. (Member, Half-Plate Postal Club).

Richard E. Smoker, 1016, So. 8th, Goshen, Indiana, U.S.A.

Frank T. Taylor, 14, Regent Park Avenue, Leeds, 6. (Member, Leeds Camera Club).

William Forrester Taylor, C.A., Lundie House, Temple Avenue, N.20. (Member, Barnet and Finchley Photographic Society).

Philip Charles Trexler, Laboratories of Bacteriology, Notre Dame, Ind., U.S.A.

Arthur John Turner, 9, Rochester Way, Croxley Green, Herts.

Albert F. Wood, 17, Cranes Park Avenue, Surbiton, Surrey.

Frederick Hans Woodward, 5, Oakwood Hill, Loughton, Essex. (Member, Windlesham Camera Club).

Maurice Edmundson, Hillcrest, Helmsshore, near Manchester.

Dennis William Franklin, 67, Downhills Park Road, N.17.

Mary Wilson Stewart (W.R.N.S.), Clifton House, Woodside, Aberdeen.

Sidney Sutton, Park Lane, Paulers Pury, Towchester, Northants.

Gordon J. S. Tingley, 11, Sunnyside, Braintree, Essex.

Patricia Lillian Tumilty (Miss), 63, South Drive, Upton, Wirral, Cheshire.

Obituary

The Council regretted to learn the loss by death of the following Members:—

G. A. Forman, of St. Helens, Lancs.

W. H. Cleave, of Liverpool.

F. C. Hopkins, of Cheam, Surrey.

Arthur S. Newman (Hon. Fellow), of London (August 12th).

Frank Forster Renwick (Hon. Fellow), of London (August 14th).

F. Sturton, of Peterborough.

Harold Wood (Associate), of Altrincham, Cheshire.

The Council stood in silence as a mark of respect to the memory of Mr. Arthur S. Newman, Past Vice-President, Honorary Fellow and Progress Medallist, and Mr. Frank Forster Renwick, Past President, Honorary Fellow and Progress Medallist.

Annual Exhibition

It was reported that the Judges in Section IV, Natural History Section, had awarded the Society's Medal to Mr. G. B. Kearey (Fellow), in respect of his exhibits, Cat. Nos. 292, 309, 353, 354, 355 and 355a, and to Mr. John Markham in respect of his exhibits Cat. Nos. 307, 327, 328 and 329.

Gifts

The following gifts were accepted with much appreciation:—

A "Lancaster" Magazine Changing Box, date unknown, with camera dated 1898, from Mr. R. A. Fathers, Hon. Secretary and Treasurer, Leicester and Leicestershire Photographic Society, for the Museum. Two books, "Practical Landscape Photography," by G. T. Harris, F.R.P.S. (1902); "Art of Retouching," by J. Hubert (1894) 6th edition, from Mr. M. Jones, for the Library. A 10ins. by 8ins. Roller Slide, from Mr. Cecil Wray (Member). Mr. Wray wrote, in offering the roller: "About two years ago I wrote to you suggesting that you should not send me *The Photographic Journal* as my sight was so bad I could not see to read it. For some time it did not come, then it began to arrive again and it has been coming regularly ever since. I cannot now even see the pictures, so it is useless to me and waste of the *Journal* and postage. Many years ago I knew the late Mr. Werneke, who was then experimenting with photographic films, especially

JUNIOR MEMBERSHIP

Robert Donnelly, 2, Central Avenue, Levenshulme, M/C. 19, Lancs.

THE PHOTOGRAPHIC JOURNAL

THE OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND
THE PHOTOGRAPHIC ALLIANCE

HONORARY ADVISORY EDITORS.—*Scientific and Technical Section* : C. WALLER, M.Sc., A.I.C., F.R.P.S.
Literary Section : J. DUDLEY JOHNSTON, HON. F.R.P.S. *Kinematograph Section* : R. H. CRICKS, F.R.P.S.
EDITOR : H. H. BLACKLOCK, F.R.P.S.

VOLUME
XXIII

NOVEMBER, 1943

TWO SHILLINGS
AND SIXPENCE



SALMESBURY OLD HALL

R.P.S. Annual Exhibition

J. T. SWARBRICK

ALLIANCE COMPETITIONS, 1943

The management of this year's competition was in the hands of the Central Association and the following analysis of the results shows the position attained by the Federations.

(a) Number of clubs supporting ; (b) Number of members contributing ; (c) Number of Prints or Slides entered ; (d) Total Marks ; (e) Average marking ; (f) Number of Prints or Slides selected for circulation.

Federation, etc.	Prints					
	(a)	(b)	(c)	(d)	(e)	(f)
Yorkshire Photographic Union	11	17	20	95½	4.77	12
Central Association	14	34	34	159	4.67	18
Northern Counties Photographic Federation	5	15	15	67	4.46	9
Midland Photographic Federation	12	19	22	91	4.13	12
Lancashire and Cheshire Photographic Union	14	20	20	74½	3.72	Nil*
Western Counties Photographic Federation	4	14	15	52½	3.5	3

Federation, etc.	Slides					
	(a)	(b)	(c)	(d)	(e)	(f)
Central Association	13	18	22	117½	5.34	19
Lancashire and Cheshire Photographic Union	10	17	20	99	4.95	Nil*
Yorkshire Photographic Union	9	18	20	90½	4.52	19
Northern Counties Photographic Federation	6	11	15	54½	3.63	13

* No selection was made from either Prints or Slides sent in by the Lancashire and Cheshire Photographic Union as it was not possible to comply with the Union's conditions under which alone the circulation of selected work would be permitted.

Judges : Bertram Cox, Hon. F.R.P.S., Geo. C. Weston, Hon. F.R.P.S.

NOTICE TO SECRETARIES

The selected Prints will be on view at Prince's Gate during December, 1943, but subject thereto they are available to Societies in two Portfolios (No. 1 and No. 2 respectively), to which commentaries have been contributed by Mr. J. S. Waring, F.R.P.S.

The selected Slides will similarly be on view during December, after which they will be put into circulation. The commentary is by Mr. A. E. Marden, A.R.P.S.

The Alliance Lectures Committee are deeply grateful to both these gentlemen for critiques written in the friendly and helpful spirit that all who are acquainted with them personally have learned to expect.

PICTORIAL PRINTS SELECTED FOR CIRCULATION

PORTFOLIO NO. 1

1. Happiness ... P. Harrison (Bradford P.S.)
2. Calm Morning Miss L. R. Benham (Newcastle-on-Tyne P.S.)
3. A Corner in Henley G. W. Bott (Small Heath P.S.)
4. Cortina ... †S. F. Sale (Northants P.S.)
5. The Edge of the Sea V. G. Rhodes (Scarborough P.S.)
6. The Way In ... W. F. Edney (P.P.P.)
7. Tide Pattern ... W. Forbes Boyd (P.M.P.P.)
8. Winter *Dr. S. D. Jouhar (Twickenham P.S.)
9. The High Hall Garden †Alex. Keighley (Bradford P.S.)
10. Winchester ... *F. J. Jones (Twickenham P.S.)
11. Maureen ... J. Sharpley (E.M.I.C.C.)
12. Design ... *J. S. Waring (Halifax P.S.)
13. Now, Boys! †D. Kingsbury (Gloucestershire P.S.)
14. Mr. Tulkington J. Staples (Hampshire House P.S.)
15. Here's to You *J. Stuart Taylor (Hampshire House P.S.)
16. Sonning Bridge Clarence Ponting (Windlesham P.S.)
17. Low Tide, Chelsea †C. W. Johnson (Harrow P.S.)
18. Gibraltar Farm Miss I. M. Longbotham (Halifax P.S.)
19. The Patriarch ... C. H. Guy (Bath P.S.)

20. Rue Jerzual, Dinan †Fred Green (Birmingham P.S.)
21. Circus Mother ... †D. Jewsbury (Solihull P.S.)
22. Seascape ... W. N. Plant (Leicester P.S.)
23. Wayside Milk Bar E. Beatrice Higgs (Rugby P.S.)
24. Carol ... Sinclair Bruce (Sunderland P.A.)
25. Forbidden Playground †W. J. Brown (South Shields P.S.)
26. Pulpit Steps, Durham †J. Spence (Sunderland P.S.)
27. A Winter Landscape †T. Ambler (Bishop Auckland P.S.)

PORTFOLIO NO. 2

1. Tyneside Reflections J. B. Redfern (South Shields P.S.)
2. Maytime ... H. S. Stubbs (Kynoch P.S.)
3. Freedom *Mrs. K. M. Parsons (Windlesham P.S.)
4. Bamburgh Castle †L. Kershaw (Bradford P.S.)
5. Truro Cathedral M. Houghton (Keighley and District P.S.)
6. Sails, Chioggia ... †Alex. Keighley (Bradford P.S.)
7. Mischief ... M. H. Lambert (South Shields P.S.)
8. A Veteran Lunesdale Worthy Sam Thompson (Gloucestershire P.S.)
9. Gloria ... †D. Kingsbury (Sutton Coldfield P.S.)
10. Undercroft, Wells *Wm. A. Clark (Birmingham P.S.)

- Falaise, Ste. Trinité *J. E. Hall (Birmingham P.S.)
 Fantasy ... *J. S. Waring (Halifax P.S.)
 Secret Agent ... Martin C. Hannon (Solihull P.S.)
 S. T. Bridgen ... *Bertram Sinkinson (Stafford P.S.)
 Wells ... *W. E. Gundill (Dewsbury P.S.)
 Wintry Afternoon †N. A. Scurrah (Bradford P.S.)
 Heber's Ghyll ... *H. L. Grainger (Leeds C.C.)
 Night Cap ... Stanley Groves (Harrow C.C.)
 Reveillé ... †Col. G. B. Barton (P.M.P.P.)
 Old Pewter †D. Owen (P.P.P.)
 Salt of the Sea... ... E. S. Taylor (Bristol P.S.)
22. Memorial, Vimy Ridge †A. Royden Willets (P.M.P.P.)
 23. Tivoli Corner (Bank of England) C. R. Harper (Twickenham P.S.)
 24. It's My Boy Friend †F. C. Diemer (Newcastle-on-Tyne P.S.)
 25. Stuiben Fall †Rev. Egerton Ryerson (Hampshire House P.S.)
 26. A Hun has Passed †Noel C. Harbutt (Bath P.S.)
 27. Woodland Sunshine and Shadow Mrs. L. M. Smith (Newcastle-on-Tyne P.S.)

SLIDES SELECTED FOR CIRCULATION

CENTRAL ASSOCIATION

- y VII Chapel ... S. E. Whitaker (Croydon C.C.)
 utumn Evening *A. Hanson (Hampshire House)
 ea Reach, Evening †C. W. Johnson (Harrow C.C.)
 ing, Rochester ... †A. E. Marden (Norwood C.C.)
 Old Square ... †A. E. Marden (Norwood C.C.)
 Fall W. Lee Thomas (P.P.P.)
 Against the Sky †T. L. Williams (Southampton C.C.)
 of Brinken Wood *W. R. Kay (Southampton C.C.)
 y Wood ... E. C. Lomer (Southampton C.C.)
 ighbour ... A. R. Thomas (South London C.C.)
 Lakeside P. B. Dannatt (South Suburban P.S.)
 Tasty, Very Sweet *G. E. W. Herbert (Sutton C.C.)
 ge ... *G. E. W. Herbert (Sutton C.C.)
 News ... G. E. Oakley (Twickenham P.S.)
 of Temple Church *F. J. Jones (Twickenham P.S.)
 artholomew's, Smithfield *F. J. Jones (Twickenham P.S.)
 nn Mist *Dr. S. D. Jouhar (Twickenham P.S.)
 ght on Grace *Dr. S. D. Jouhar (Twickenham P.S.)
 Pasture ... Mr. Trotman (Uxbridge C.C.)

NORTHERN COUNTIES FEDERATION

- g the Shoe †T. Ambler (Bishop Auckland P.S.)
 dendrons ... J. W. Mattinson (Carlisle C.C.)
 ad New... J. H. Kaye (Newcastle-on-Tyne P.S.)
 jury, Cheshire †W. J. Brown (South Shields P.S.)
 Valley Road †W. J. Brown (South Shields P.S.)
 Waters ... †W. J. Brown (South Shields P.S.)

- Mischief ... M. H. Lambert (South Shields P.S.)
 Friends ... M. H. Lambert (South Shields P.S.)
 Sweet Seventeen ... D. R. Morris (South Shields P.S.)
 Springtime ... W. J. Wear (South Shields P.S.)
 South Aisle of Choir, Durham J. Dixon Johnson (Sunderland P.A.)
 On the Greta... J. Otterburn (Sunderland P.A.)
 Mountain Cross Miss L. Wincote (Sunderland P.A.)

YORKSHIRE PHOTOGRAPHIC UNION

- Mystic Calm ... †H. Thackuray (Bradford P.S.)
 Ice Reflections ... †N. A. Scurrah (Bradford P.S.)
 Haze in the Valley ... J. F. Mather (Bradford P.S.)
 Dorothy Perkins ... *J. S. Waring (Halifax P.S.)
 Fantasy ... *J. S. Waring (Halifax P.S.)
 Earthenware... *J. S. Waring (Halifax P.S.)
 Stormy Weather ... P. S. Colledge (Halifax P.S.)
 Winter's Mantle ... *E. M. Mellor (Harrogate P.S.)
 The Sentinels ... J. A. Carpenter (Harrogate P.S.)
 Creation ... †H. Atkinson (Huddersfield P.S.)
 Down to the Sea Again ... H. Carlidge (Hull P.S.)
 Grapes ... †R. E. Booth (Hull P.S.)
 Silver and Silhouette ... J. P. Phillips (Leeds C.C.)
 The Matterhorn ... E. G. Ashton (Rotherham P.S.)
 Age ... Harry Bennett (Scarborough P.S.)
 Donkey Engine ... †V. J. Watson (Scarborough P.S.)
 Alum Pot ... G. E. Proctor (York P.S.)
 Rosemary ... J. H. Fraser (York P.S.)
 Neptune Calling ... F. Vear (York P.S.)

* = F.R.P.S.

† = A.R.P.S.

‡ = Hon. F.R.P.S.

BIRMINGHAM PHOTOGRAPHIC SOCIETY

opening meeting of the 14 Session was held at York on Tuesday, October 5th. The President, Mr. P. F. Han, presided, there being five members and friends present. The meeting was held with The Royal Photographic Society, and the President welcomed members of that body as were in audience.

President called upon Mr. W. Herbert, F.R.P.S., to give illustrated lecture, "Little England Beyond Wales," already published in *The Photographic Journal*, 1942, pp. 58-64. This dealt

with the Tenby area of Pembrokeshire and the Gower Peninsula, Glamorganshire, and consisted of a breezy description of holiday exploration of the two areas. The talk was profusely illustrated with slides, developing from the frank snapshots of his early holidays in Tenby to the later efforts in which were mirrored advances both in available photographic technique and in the pictorial ambitions of the photographer.

A review was given of the topography of the districts, with pictures of castles, churches, crosses, lily ponds and cromlechs, but, above all, of the beautiful coastline with its predomi-

nance of rugged vertical limestone cliffs, with their caves, natural arches and blowholes.

Finally, Mr. Herbert described an excursion to the Vale of Neath, with its junction of three rivers and its many delightful waterfalls.

Vote of Thanks

A vote of thanks was proposed by Mr. Aldridge, who, from personal knowledge of the districts concerned, was able to congratulate Mr. Herbert on the excellence of his slides and upon the apt humour of his running commentary. The vote of thanks was carried with applause. E.S.T.

ANNOUNCEMENTS

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2 2s. 0d.; Group subscriptions, which became due for renewal on the same day, are as follows: Scientific and Technical Group, 7s. 6d.; Pictorial Group, 5s.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s.; Kinematograph Section, 5s.

Group subscriptions may be included with the Annual Subscriptions, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscriptions to the Society through their own Bank to The National City Bank of New York, in New York, or direct to The National City Bank of New York. Such subscriptions should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square Branch, London, account. Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to ask them to mention their names, addresses and status (Fellow, Associate, Member); and Members making the remittance direct to The National City Bank of New York are requested to give this information.

It is important to note that payment should be made

"For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the same time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

LECTURE PROGRAMME

Friday, November 5th. 6 p.m. Meeting of the Pictorial Group. "The Pictorial Photographer and Colour." By Bertram Cox, Hon. F.R.P.S.

Saturday, November 6th. 3 p.m. Meeting to be arranged by the Colour Group. "Car, Camera and Colour." By R. Binder.

Saturday, November 13th. 3 p.m. "Spanish Architecture." By J. R. H. Weaver, M.A., F.R.P.S.

Saturday, November 20th. 3 p.m. Meeting to be arranged by the Kinematograph Section.

Saturday, November 27th. 3 p.m. "Meditations and Recollections: Fifty Years of Photography." By Charles Eshborn, A.R.P.S.

Friday, December 3rd. 6 p.m. Meeting of Pictorial Group. "Table Top Photography." By E. Heimann, F.R.P.S.

Saturday, December 4th. 3 p.m. Meeting arranged by the Miniature Camera Group. "Review of Literature and Developments of Interest to the Miniaturist." By Percy W. Harris, F.R.P.S.

Saturday, December 11th. 3 p.m. The Traill Taylor Memorial Lecture. "Sensitometric Apparatus for Controlling the Manufacture of Photographic Materials." By E. R. Davies, B.Sc., F.R.P.S.

Saturday, December 18th. 3 p.m. Joint Meeting of the Scientific and Technical Section with the Association for Scientific Photography. Conversazione, Exhibition and Demonstration of photographic equipment used for scientific and industrial investigations.

Friday, January 7th. 6 p.m. Meeting of Pictorial Group. Lantern Evening. "My Favourite 100 Slides." By J. Dudley Johnston, Hon. F.R.P.S.

Saturday, January 8th. 3 p.m. Meeting of Colour Group.

Saturday, January 15th. 3 p.m. Meeting arranged by the Miniature Camera Group. "Composition." By Ricardo.

Saturday, January 22nd. 3 p.m. Meeting arranged by the Kinematograph Section.

Saturday, January 29th. 2.30 p.m. Meeting arranged by the Scientific and Technical Group. Symposium on Microdensitometry and Microsensitometry.

JOINT MEETINGS

Birmingham Photographic Society, York House, Great Charles Street, Birmingham. Tuesday, November 30th. 6.45 p.m. "A Tale of the Seven Seas." By Thomas W. Karran, A.R.P.S. Tuesday, Decem-

ber 14th, 6.30 p.m. "An Historical Review of Colour Photographic Processes." By F. J. Tritton, F.R.P.S.

Bradford Photographic Society, The Science Room, Mechanics' Institute, Bridge Street, Bradford. Saturday, November 27th. 2.30 p.m. "The Camera as a Means of Artistic Expression." By H. Bairstow, F.R.P.S. Saturday, February 12th, 1944. 3 p.m. "Architectural and Record Photography." By J. Crowther Cox, F.R.P.S.

Bristol Photographic Society, The Grand Hotel, Bristol. Saturday, November 27th. 3 p.m. Lecturer: Percy W. Harris, F.R.P.S.

Bath Photographic Society, 13, Lower Borough Walls, Bath. Thursday, January 27th, 1944. "Camera Portraits and their Making." By Arnold Longman, F.R.P.S. Thursday, March 23rd. "Glimpses of the Alps." By Mrs. Emonet, A.R.P.S. This meeting will be held in the Pump Room.

Leeds Camera Club, Leeds Institute, Leeds. Monday, January 10th. "Lower Wensleydale, Past and Present." By H. Bryce Thomson, A.R.P.S.

Nottingham and Notts Photographic Society, Scouts' Hall, Shakespeare Street, Nottingham. Saturday, December 11th. 3 p.m. "Dalmatia, the Coast of a Thousand Islands." By Bernard B. Cox. (Lecture illustrated by Agfacolor Miniature Slides.)

Preston Scientific Society, Photographic Section, Ellesmere Chambers, Church Street, Preston.

Rotherham Photographic Society, The Crofts, Moorgate, Rotherham. Sunday, December 19th. "Against the Rules." A talk by H. T. Smith, A.R.C.A. Sunday, March 19th, 1944. "Approach to Natural History Photography." By Frank Newton.

EXHIBITIONS AT PRINCE'S GATE

November. (1) Diamond Jubilee Exhibition of the Works of Alexander Keighley, Hon. F.R.P.S. (2) Prints by Dr. S. D. Jouhar, F.R.P.S.

December. (1) Photographic Alliance Competition Prints. (2) Colour Photography, arranged by the Colour Group.

January, 1944. (1) Prints by Mrs. K. M. Parsons, F.R.P.S. (2) Prints by Douglas Croall.

Feb. (1) Prints by Members of the Institute of British Photographers.

March. (1) Prints by Members of the Miniature Camera Group. (2) Prints by Lieut. R. G. Fennah, F.R.P.S.

April. Prints by Overseas Readers of *The Amateur Photographer*.

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VOLUME
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DECEMBER, 1943

TWO SHILLINGS
AND SIXPENCE



NORMAN SETTING, WINCHESTER

P.P.S. Annual Exhibition

B. HUTCHINGS, F.R.P.S.



Blue Tit with a large family

A FILMIC APPROACH TO NATURE STUDY

By John Chear, F.L.S., M.B.O.U., F.R.P.S.

At the Joint Meeting of The Royal Photographic Society and the Birmingham Photographic Society, held at York House, Birmingham, on March 9th, a lecture bearing the above title and a display of films were given by Mr. John Chear, F.L.S., M.B.O.U., F.R.P.S. The Chairman of the Cine Section, Mr. F. Wakeman, occupied the chair.

MR. CHEAR said that first of all he would like to say how pleased he was to be able to visit the Birmingham Society again and to convey to them the greetings of The Royal Photographic Society.

The policy of these joint meetings seemed to be one which, though a war development, should be continued after the war as a means of bringing together The Royal Photographic Society and the other Societies in a way which cannot be but to their mutual advantage.

Uses of the Filmic Approach

In considering the application of the cinematic process to Nature Study, it is well at the outset to take a utilitarian point of view and commence with the uses of that particular line of approach.

It seems that they can be summarised as follows:—

- (a) Observation at second hand where direct observation is difficult.

- (b) Planned observation, such as:
 - (i) Of events in a sequence placed in proper relation to each other, e.g., a bird's life history.
 - (ii) Altering the time scale, e.g., speeding up or slowing down movements.
 - (iii) Selection of observations to cover a piece of natural life, involving a community of wild animals, e.g., a woodland.
 - (iv) Selection of habits to show effects of environment on life, e.g., the adaptation of birds to life on water.

Limitations

At the same time, it is well to be in mind that there are certain limitations to the effectiveness of cinema in Nature Study. These may be summarised in this way:—

- (a) The film must always be based on facts from the known and progress towards new facts. The film should be sound, educationally and biologically; the audience must have a point of contact with their own experience.
- (b) The visual appeal of the film, i.e., of second-hand observation, serves to impress the result of study, but cannot take its place. The film is an aid to, rather than a means of, education.

General Approach

Having defined what one cannot do, it is well next to consider what should be the general approach of films to Nature.

Films of Nature should proceed on the basis of regarding Nature as an open book for those who can read; not treating natural things as mysteries—the closed book. For instance, in the case of adaptations to environment arising in the course of evolution, they are general principles that feet placed back in relation to the body as on the water will give greater power than if they were placed further forward as in the case of birds.

(1) Webbed feet far back for propulsion. It is quite obvious on anatomical principles that feet placed back in relation to the body as on the water will give greater power than if they were placed further forward as in the case of birds.

(2) Small strong wings for swimming under water—a medium of greater resistance than air, therefore, not needing the same shape of vane.

(3) Feathers close and naturally oiled to prevent wetting.

Photographic Approach

The methods of Nature

are as various in detail as the number of photographers, but the first purpose must over-ride the rest.

Photography is the means to the end. The purpose of the film is in view from the first and the shots subordinated to it. Films are a mode of expression for a person who is at the same time a naturalist and a photographer and carries his two interests to something of value to the community as a whole. They are a means of expressing art—a method of expressing oneself—to the service of science—generally of people at large.

All films (and Nature films excepted) are an outlet for the instinct which, in modern times, has no expression in many kinds of natural work. After planning a film, making a great many efforts to carry out the original design, with additions which might have led to one as improvements, and after finally completing the work, the sending of it out with a message to the audience is like putting a child into the world.

A film must create a chord of sympathy between itself and the audience. It does this best by providing a connection between the life of their own lives and the life of the birds.

There is in a very large number of British audiences a definite interest in birds, and therefore a bird film has that initial advantage; but it must go beyond the experience of the audience, e.g., a rare bird, is not of appeal as one extending their knowledge and increasing the significance of those birds of which they know something.

It is good advice to give to cinematographers for use in films when films could be obtained and when war-time restrictions on photography were removed, to make films around themes and subjects with which they were really interested and in which they would find double interest, photographic and subject matter.

In his first film he would show, "Everybody's Birds," was one on which, as the lecturer lived in London City, was to his hand; as the effect of the increase of bird life in this country on bird life was the main theme. It should be observed that in gardens the number of bird population may be as thirty to the acre, whereas on a field, on an average, it does not have one bird to two acres. The main and subsidiary theme was to show the life histories of three birds which have adapted themselves to garden life: the blackbird and blue tit. Of

these, the blackbird is one of the two commonest birds in England, and the robin one of the two next common. The garden had therefore three advantages:—

(1) It was near; and in order to carry through a film of a certain environment one had to be there frequently over a considerable period.

(2) A garden contains some of the most colourful English birds as well as some of the commonest, well known to everybody, and from which one could draw conclusions that most people would appreciate.

(3) It provided a theme both of general application in natural life and on a social topic.

The first aspect of the theme was that the birds which succeeded were those which had adapted themselves to what was the biggest factor, perhaps, in the totality of factors affecting natural life in this country, i.e., man's interference. The birds which were intolerant of man and retired to the wilds got compressed, decreased in number and were gradually pushed out, whereas those which made friends with the interloper, as the garden birds did, had a better time and increased in number.

Adaptability was a great key to success among natural forms. Man himself had succeeded in competition with other animals largely because of his great adaptability. And among the human kingdom adaptability was a giver of great advantage to its

possessor. It was a principle at variance with extreme specialisation.

The other aspect of the theme was the significance of the English love of gardens, in promoting not only a healthy life, but in promoting an increase of our birds.

At this point, "Everybody's Birds," which covers the lives of three pairs of birds, a pair of robins, a pair of blackbirds, and a pair of blue tits, in the garden for six months, was projected.

The lecturer said there was a real thrill when a robin fed her youngsters while they rested on his hand (particularly when he had not coaxed her to do so) and when the blackbird allowed his finger to stroke her in the nest. How that happened he did not know—Mr. Chear had no claims to any magnetic force—the bird built in a hedge with people continually passing by. Probably also it was necessary to approach her with a certain amount of confidence to gain hers—a principle well known to those dealing with animals.

The film was in colour, and here the amateur seemed to be at an advantage with the professional, for he had the use of the Kodachrome process. The professional seemed confined to Technicolor, which probably needed more elaborate apparatus, with the probability of more disturbance to the birds. Apart from its great value for identification, colour gives



Robins on its way to feed the family.



A filmic sequence showing Willow Warbler (1 and 2, top) approaching nest with a mouthful of feathers, (3, bottom left) arranging feathers in the nest, and (4, bottom right) having left the nest. In No. 4 it will be noticed that she has also incorporated into the lining the feathers which show on the floor of the entrance in Nos. 1, 2 and 3

a great deal more contrast than monochrome, and this was particularly useful in Nature photography, where great clarity is essential. On the other hand, in a colour shot there was greater work for the eye to take in the colour values, and so it was necessary to hold the shot rather longer than the same shot in black and white.

Technique

Mr. Chear did not use a very elaborate outfit, but had the advantage of a first-rate camera for the job in the Kodak Cine Special. On a tripod, which was necessary for this work, quite steady pictures could be obtained even with high-powered telephoto lenses. Some of the shots, notably that of the robin feeding her youngsters in the lecturer's hand, were obtained at two feet with the one-inch lens, and, in this particular case, at four times the normal speed. In spite of the noise, the bird was quite happy. This question of increased speed often arose in bird films, because the bird's actions were so quick that, for the audience to appreciate them, double speed in the camera was necessary. There was thus a continual tussle between the

requirements of speed and the limit of stop which could be used, especially in telephoto work.

Generally speaking, it was a safe rule that the bird must be sufficiently large on the screen for the individual feathers to be apparent. To satisfy this and to keep the bird within the angle of the lens and within the depth of focus allowed was always a problem. That was why a centre of attraction, such as the nest, was so useful.

The second film, "Beneath the Trees," was designed to illustrate the cardinal features of a woodland as a community of plants, insects, animals and birds living together in association. The plant life is the foundation, and, in every woodland, can be divided into four levels:—

- Ground flora;
- Herb level, 1-3 feet;
- Shrub level;
- Standard tree level.

The woodland is overtaken by green in the spring from the bottom level upwards. One feature of flowering plants in a well-developed wood is that their flowering period is early, before the standard trees are in leaf. This is a good example of the way the habits of one part of the

plant life dovetail, as it were, into the habits of another.

The trees in natural woodland represent the result of a long series of supersession of one form of dominant plant by another, and may represent a climax form of vegetation, i.e., a form which, in the climate of the island, is not likely to be superseded by any other form—apart from human interference. This is usually so in the case of an oak wood.

The insect life, bird life and animal life represent an ascending scale of forms each dependent on the others for food. The lowly insects feed on the plants, other higher insects on the lower ones, the birds on the insects of various sorts. The birds of prey depend on the smaller birds, the animals depend on all the others for their existence.

The life in a woodland represents a balance between all these forms and the disturbance of any one affects, in turn, the numbers of the others. For example, a great decrease in small birds would result in a great increase in the defoliating caterpillars, and these, in turn, might as a result defoliate some of the trees beyond recovery if the process were to extend over a long period.



Greater Spotted Woodpecker



Chaffinch feeding young

film, which was again in was then projected with a tary by the lecturer linking incidents with the general as in his preceding talk. The yed forward on a seasonal king the audience through the owing the outstanding fea-a woodland and its life from mence of one year to the

I Basis

ear pointed out that this film gned, as indeed have been all s, to emphasize the com-view of natural life. Birds, nple, could no more live in than human beings, and the m which many of his bird veloped was to show the life communities and consider the ion between bird communities an society. In the film just however, the community idea ended to cover the basis of ion between plants in a wood- ch of which had to fit in as it ith the habits of the others. the idea reached its full ment in the consideration of nt, insect, bird and animal ities as one whole association forms.

y, the lecturer said it had been his particular care that should suffer through having , through his camera, a into its life. Bird photo- s should be especially careful ve the test that if either the he photograph had to suffer, d always be the photograph, ever be said justifiably that photographer is a menace to s.

Mr. WARWICK rose to propose a hearty vote of thanks to Mr. Chear. He said how much he had appreciated the lecture as he was a bird photographer, although not a cine photographer. He was anxious to know a few more technical details and to hear some of the difficulties encountered.

Mr. F. G. RATCLIFFE also said he wished to add his thanks and appreciation. He would also like further information, particularly as to how Mr. Chear managed to adjust the exposure of one particular long panorama shot which embraced the deep shade of woodland to the top of a very high tree. Mr. Chear explained that the camera he used was a Kodak

Special, it had a six-inch telephoto lens, reflex focusing on the gate. He stated that he found no difficulty in keeping birds in focus on the trunk of a tree, even though the depth of focus was small, because they were nearly always in the same plane. The sky background was often a difficulty. He preferred a side light if possible. The mixes were done by means of the variable shutter and the back wind fitted to the camera. He explained how he adjusted the exposure in panning from the bottom of a tree to the top—he closed the diaphragm while panning.

The vote of thanks was passed with much applause, and Mr. Chear replied.



Outside the Béguinage, Bruges

BRUGES IN AGFACOLOR

By J. E. Hall. F.R.P.S.

A JOINT meeting of The Royal and Birmingham Photographic Societies, held at the headquarters of the B.P.S., York House, Birmingham, on Saturday, December 5th, 1942, the President, Mr. G. Bernard Mason, in the chair, was devoted to a lecture, "Bruges in Agfacolor," by Mr. J. E. Hall, F.R.P.S., Hon. Treasurer of the Society.

The lecturer has made periodic visits, since 1905, to the "Venice of the North," but it was not until 1937 that he found himself able to exploit the possibility of rendering its varying and lovely tints in Agfacolor Flat Film. Three journeys in 1938 and another in 1939 provided further opportunities for registering effects recording each of the seasons; the idiosyncracies of Hitler necessitated hurried returns to port, but conditions were in other respects ideal, a fact proved by a long hundred slides rigorously selected from the exposures safely passing the Customs. They illustrate phases of the best of the city's architecture, of its bridges, quays, ramparts, and comprise numerous canal scenes, interspersed with ecclesiastical and other interiors.

Beginning with a short general description of the ancient Flemish City, a luscious orgy of colour depicted tree-shaded squares, luminous with the glints of spring sunshine, medieval buildings enriched by step gables and dormer windows, delight-

ful vistas of derelict canals beyond the city gates. A passing reference to the persistence of smells amid such a multiplicity of canals was happily succeeded by a detailed survey of the most famous of Bruges's architectural gems: the Belfry, the Cathedral, the Church of Notre Dame, St. John's

Hospital, the Gruuthuse Manor House, the Town Hall.

Romance was not forgotten. A visit to the entrancing Lac d'Amour—Lovers' Lake—introduced the story that a sip of its water made one irresistible to the lady of one's choice, and two hearts were eternally bound together. Then there was a ghastly story connected with the monastery and nuns' convent in the Augustinian quarter of the city, a quarter where the lecturer had spent many a happy *quinzaine* associated with an almost perfect cuisine and service at moderate cost. Each day was ushered in with hot rolls, delicious un-rationed butter, non-synthetic coffee—what an ecstatic pleasure to escape, for a time, from the stodgy, fulsome, body-building, temper-destroying English breakfast! The convent witnessed centuries ago, a sacrilegious crime, the murder of a beautiful chaste novice by a monk, devoured by trancelustful love. This strange event was re-enacted years later when, with the aid of a medium, the re-incarnated monk confessed the details of the murder in the chapel and the burial of the body in the cellar. The next day the murdered nun, dressed in white, and holding in her hands a crucifix pressed to her breast, showed herself in the cloister, and immediately disappeared. It is said that there are occasional re-visitations of the originals in what is now a large private residence, but on this the present occupier preserves a strict neutrality.



Hôtel de Ville, Bruges



'St. Anne, from the Sanctuary Screen

ing from the romantic side to ty, the world-famous Green was depicted under different s of season and atmosphere; guinage, a bijou assemblage of cottages, with façades, roofs bles as varied as are the char- of their pious inhabitants, ustrated by a series of slides h pigeons and people vied for t; at Sainte Croix, on the te side of the city, we stood on ill Hill—below us, the ambient s of the poplars and the reflec- of the village in the waters of nal. Gazing westwards, an sive panorama unfolded itself, he monuments of Bruges sil- ed against the horizon, crowned read of cloud dear to the heart landscapist. The words of a h writer, in a free translation, it the scene: "There, behind s in bloom, in the blue haze of tance, and under the soft sky, e towers of the town: the : Notre Dame, the massive ral, the Belfry delicate as a he slim tower of St. Anne's

behind the round cupola of Jerusalem Church, the minaret of the Porter's Lodge, the tower of St. James's, the tracery of the turrets and spire of St. Sebastian—Oh, Bruges! how beautiful art thou!"

The Town Hall (Hôtel de Ville) is the most elegant and graceful of al. the edifices in the Town Square. The six octagonal spires and the crenelated roofing are seldom effectively lit—we are looking south-west. To break the monotony of immense bareness, the architect of the four- teen hundreds pierced the facade with six windows reaching almost to the roof, surmounting each with a golden angel. He also provided 50 niches with saints, counts and countesses.

The high spot of the lecture was perhaps the visit to the Gothic Church of Notre Dame, whose impos- ing spire reaches to a height of more than 400 feet. We seem to hear again the tender-voiced verger, kindness personified, describing in picturesque English the riches of the church, in- cluding the wonderful painting

which abound as in all the other sacred edifices. He traces with the aid of an altar candlestick the mas- terly lines of Michael Angelo's statue of the Madonna and Child, "faces graciously pure, drapery dignified, a sweetly natural child, a compellingly human mother." The cenotaphs of Charles the Bold and his daughter are Gothic art at its best, and colour is the only satisfactory rendering, es- pecially of the delicate work of the goldsmith founder of Mary's effigy and tomb.

Began in 1495, completed in 1502, the monument shows Mary in the graceful folds of a full mantle with richly wrought borders. On her head rest a jewelled net and small diadem; her feet are supported by two dogs, a mastiff and a terrier. Her hands are as dainty as one could imagine those of a greatly adored duchess to be. There seems an air of mystery about the angels clustered round the coats of arms embellishing the sides of the tomb, so different from the merely beautiful women portrayed on the tomb of the Duke, her father.

It was fitting that the belfry tower, which was the principal feature in many of the scenes, should appear floodlit at night in the last slide of all.

That poem in stone is visible from almost every part of the city. It rises like a gigantic mark of exclamation, as someone has said, from the Market Square, and its carillon is heard re- sounding from the octagonal lantern above the pavé of Wool Street, tin- tinabulating as you wind your toil- some way up the many steps towards the summit of the tower. Where you stand with Longfellow—

"Listening with a wild delight
To the chimes that through the
night

Ring their changes from the Belfry
Of that quaint old Flemish city."

The lecture was delivered in that fine descriptive language, punctuated at intervals with dry humorous touches, with which Mr. Hall's name has become famous, and ended with the sincere expression of the hope that Bruges would soon be free again for English visitors to record its many beauties.

Vote of Thanks

Mr. PERCY F. BIERMAN, A.R.P.S., President-elect of the B.P.S., moved a hearty vote of thanks to the lec- turer for what he characterised as a most perfect and charming record. Difficult it was to believe that it could have been compiled so excel- lently by a single worker, who, never- theless, had referred to himself as "the one mad photographer in Bruges." The vote was carried with acclamation.

MAKING THE FINISHED PRINT

By R. H. Mason, F.R.P.S., F.I.B.P.

A Meeting of the Miniature Camera Group of The Royal Photographic Society was held on July 17th, 1943, at 16, Prince's Gate, S.W.7. Col. W. Symon was in the chair, and Mr. R. H. Mason addressed the Members on "Making the Finished Print."

MR. MASON spoke as follows: The whole subject of making the finished print is far too complex for one afternoon's discussion, and I can only pass lightly over the more important points of the various processes and endeavour to give you a brief conspectus of the various methods in use to-day. As a professional I have been fortunate in having had the opportunity to try out most methods, and during the course of ten years I have picked up a few hints and tips which may be of use to you. A lecture of this kind is not practical unless it mentions commercial products by name, but I assure you that I have no financial interest in any of them.

I have been interested to note that many photographers, especially miniaturists, will spend hours in getting a perfect negative, but after that they take no trouble at all, developing their prints, for example, in very ancient and badly-mixed developer. Having made a mediocre print, they will then spend many hours putting it right, oiling and pencilling, and so on. I should like to tell you how we, as a commercial firm, prepare our prints. When turning out hundreds of prints a day, we must have an economical, but efficient, process. We have a trough about seven feet long, heated by electric bulbs, with thermostatic control, and our entire printing, right from the developer to the final wash, is kept at a temperature of 70°. We use Johnson's standard developer, which is normally diluted 1:7, but we dilute it 1:10. In front of the developing dish we have a small dish in which there is a drop of the concentrated developer. As soon as the print is put in the developer we take a piece of cotton wool soaked in the concentrated developer and when the image begins to appear we smear the cotton wool quickly over any part which is not coming up quickly enough, thus obviating any necessity for control in enlarging. This must be done deftly and quickly, or stains may result.

From the developer our prints go to the rinsing bath for a minute and then into plain hypo—not acid hypo. In front of this we have a little

saucer or dish with a one per cent solution of potassium ferricyanide, and if parts of the image have come up a little too dark a piece of cotton wool is soaked in the ferricyanide solution, the print is lifted out quickly, the portion which is too dark is wiped over, and the print is then plunged back into the hypo. It needs the combination of ferricyanide and hypo to do the work, but the print may get stained if it is kept too long out of the hypo.

After a minute or so the print is taken out, given another rinse, and transferred to acid hypo. Altogether, I suppose we spend six or seven minutes in producing a print—not very much longer than most people take—and we save ourselves much after-work in local corrections of tones. The method has also a great advantage if the printing is done on glossy paper, on which not as much after-work can be done as on matt. If you get to the hypo bath with a print not satisfactory in gradation or tone, I would urge you at that stage to take your courage in both hands and throw the print away. No amount of bleaching and re-development, intensifying or reducing will ever give you a perfect print, unless it is tonally correct by the time it has reached the hypo bath. It is permissible, of course, to bleach and re-develop when it is only a case of improving the colour.



A black border brightens commercial subjects. The sky has been darkened with concentrated developer during development

Now we come to the processes we use after our print is dry. There are roughly three categories: (1) processes which are necessary to correct defects in our printing, such as spotting and knifing; (2) those processes which we use to improve artistic effect, such things as local correction and varnishing; (3) actual after-processes, such as Bromo, Bromoil, etc.

Let's come back to spotting. Formerly we always used I.C.I. naphthyl-black, but lately we have taken to using Martin's dyes. Our method of working with these is to take a brush, dip a brush in the Martin's dye, which, incidentally, is always a drop of Wettol) and transfer a drop of concentrated dye on to the corner of the palette, another corner with some water in a second palette, and to have lesser concentrations in the other corners, giving a gradient from dark to light grey. It is always better to use the dye lighter than the intended tone of the spot which it is intended to fill in and then work it in. I know some workers who work the other way by having a spot of concentrated dye and getting the print extremely dry, but it seems a bit of a business, because it is easy to make the spot a bit too dark and then difficult to lighten it again. In the case of glossy prints, a little gum is added to the dye, so that there is a slight gloss on it and it is impossible to see where there have been spots. With the naphthyl-black we used previously, it was possible, particularly against the dark, to see the spots.

In the case of large spots these are not so good, largely because they have a distinct blue tinge after drying, which does not match the intended area. This is important in the case of very small spots, but in the case of a spot it is quite apparent. For this reason we go back to water. It is not advisable to use oil, because it will come off if the print is afterwards doped.

As much for white spots. We now turn to the removal of black spots. The usual method is to use potassium cyanide on the tip of a brush and rub it out, usually using one drop at a time, usually using one drop blotting it off immediately, then another drop, and so on, until the intended tone is reached. I, personally, prefer Ilford "Corrector" solutions, which are not made for that purpose, but to correct line photographs. By diluting No. 1 solution about twice the quantity of water and applying that with the brush, you remove the spot and you only need to give a quick wipe over with a piece of cotton wool soaked in No. 2 solution and the action is



A print produced from an enlarged paper negative and printed through the paper. The original negative was 35 mm.

stopped immediately and no further work is necessary, whereas if ferricyanide is used it is necessary to wash the print afterwards.

Another disadvantage of ferricyanide is that it is apt to spread and leave a halo, whereas the "Corrector" solution seems to retain itself in the brush very much better.

Another common trouble is "tram lines." I have never found a really satisfactory method of removing them. I have tried running a bleacher along with a very fine brush, but I have never yet been able to keep to the line. The only way to remove them seems to be with a knife, and the knife requires considerably more skill than I possess, but one of our retouchers says that the secret is to work with light strokes slightly at an angle to the "tram line." There are some surfaces of

paper which take the knife very much better than others, so this does not always work.

We have now brought the print to the best stage we can get it without any artistic embellishments. We should now have what is virtually a perfect print, especially if it is a glossy paper print. So we come to oiling, or "doping" as it is often called. It will be necessary before starting, for the worker who has not done any bleaching or intensifying in the development stage, as I have described, to do his local corrections first. When any local work that is necessary has been done, the print should be dried and wiped all over with a medium. Practically every article I have seen on oiling prints gives a medium composed of one part linseed oil, one part mastic varnish, and two parts turpentine. I use the

same except that I have only one part of turpentine. With two parts of turpentine it dries too quickly for my working. This medium should be fairly liberally applied with fluffless cotton wool, and the print should be left for about half an hour before any more work is done on it. Black and brown oil colours are now mixed to match the tone of the print and applied by means of fluffless cotton wool, very little at first, and afterwards going over it again a little harder and then harder still, until, finally, we have put on a good coat of paint, which is evenly spread by rubbing until the print looks like a November fog. The highlights are now cleaned up with pledges of cotton wool, or artists' stumps, until the desired brightness is obtained. The only real tip I can give you in the application of the oil paint is to be liberal with it. I advise you to "slap it on." If you are going to dry mount your print, leave it for at least a week, otherwise you will find that the heat will remove the sheen, but it can often be restored by an application of Printamol.

There are a lot of other methods, but most of them require much more artistic skill than most of us possess, and I find oil paint just as effective. With oiling, the paper surface has quite a lot to do with the result. I have always found that Kodak Royal and Ilford Lustre papers take oiling very much better than most others. There is a tendency in some papers for the paper grain to appear when the oil paint is applied, with the result that where the oil paint is applied lightly you get a strong paper grain, and where the oil is applied liberally, no grain at all, and the effect is very unpleasant.

I will mention a few of the other processes which are interesting. The first of these is Transferotype paper. I am surprised that this paper is not used more. It is so simple and easy to transfer to an extraordinary variety of surfaces. One of my treasured possessions is a parchment lampshade on which I have printed a dozen portraits of friends of mine by Transferotype, and they have stood up now to the heat of the lamp for some years and still look nice. Another advantage of Transferotype paper to the miniaturists is that by transferring on to a rougher surface quite a lot of grain which you were not able to lose in your negative is concealed by the paper itself.

I should like to mention the enlarged paper negative process. These are very simply made and for the miniature worker they are ideal. Our method is to make a print on single-weight paper to the size we

require the final print to be, and after washing, soak it for ten minutes in a five per cent solution of glycerine. The print will then dry without any cockling or warping. As soon as it is dry any retouching desired can be done. This must be done by translucent light, with pencil or charcoal on the back of the print. You then make a negative by printing in contact, that is, emulsion to emulsion, and in the same way you should, after development of this negative, soak it in glycerine and avoid any warping or shrinkage in drying. You must, of course, dry it off naturally.

Anything that is found to be too light on the original print can be darkened quite easily by pencilling on the back of that print, and now on

pleasant intensification of blacks and a very rich deep effect as well as accentuation of the surface of the paper. For that very reason brom-etching is not very effective on some papers. I got in touch with Major Harbutt, of Somerset, who has made some delightful brom-etchings, and he told me that he works exactly as described in the *B.J. Almanac* for 1943, except that he gives about four times the normal development instead of two. I should explain that the method of working it is this. The correct exposure is found for the print by test strip, and then you give three or four times that exposure. In the *B.J. Almanac* it says you should then develop for two times normal development, but the worker



* "Bromachad" print on Ilford Royal Lustre



One of a series of portraits printed on Transferotype paper and transferred to a parchment lampshade

the reverse side of your negative, anything too dark in the first place can be lightened. From that paper negative you can make your print either by printing emulsion to emulsion or with the emulsion away, that is, with the light coming through the paper before it reaches the emulsion. By the second method you get a slight softness which in pictorial subjects is very pleasing. You will get more paper texture showing, but the paper texture, if the paper is of good quality, is pleasant and quite effectively conceals any negative grain you might have in the first place. I would particularly recommend paper negatives to miniaturists, especially 35 mm. miniature workers in portraiture, because there is nothing easier than retouching on these enlarged paper negatives.

A process of which I am very fond is brom-etching. This is a process in which the image is forced deep into the emulsion and the result is a very

I have just quoted develops at least four times, and sometimes six times, normal development.

After rinsing, the print is transferred to an etching bath made of common salt, sulphuric acid and potassium permanganate, and the high lights begin to clear away. What was a dead black print begins to look like a photograph. It has, however, to be applied in small doses. As soon as it gets into the hypo it clears amazingly and you see the print in all its richness and full black tones. Only one or two papers are really satisfactory for brom-etching, notably Old Master and Rough Lustre.

I would like to mention a few uses for Rossite resistant. Most of these have a commercial application, but some of you may find them useful. First of all, in advertising, when we want one article to stand out from its background we paint over the article on the print with this Rossite resistant. It is easy to control with a brush, and then you can bleach out or semi-bleach the background of

a different colour, in fact, you only a number of variations, doing done that and dried the u can remove the Rossite by it off with the fingers and your subject to the strength ed. In *The Photographic* recently there was an article tigrade, describing how the of the main subject and its und could be varied by the different filters. On the of that article I tried it out, ossite as the masking agent n larger baseboard, and it was atisfactory. Owing to the ges it is not satisfactory for u prints, which reminds me a word about soft focus. I, lly, do not like to see a lot of



from a paper negative made by contact printing from the original whole plate. Paper grain here is not so pronounced

us, and in the case of most us lenses which are used for g, I always think the softness one. When we require soft which is not often—we merely ece of cellophane, crumple it flash it under the enlarger about half the total exposure, st enough to get rid of the ss of the negative when using paper. Quite often also I number of printers get soft ects by blowing smoke in designs under the enlarger do not recommend blowing e lens, or condensation may

e question of mounting, there one piece of advice that I ve, namely, that it should be I have never yet known a y steak which was made any y being served on two plates, top of the other, and yet I rints on two or even four I have not yet seen a good

print which has been spoiled by being mounted on a piece of plain white card without any coloured borders or fancy effects. Nearly all the best workers, our really leading photographers, mount their prints straight on to white card without any elaboration whatsoever. I am rather fond of narrow black borders, particularly with glossy paper prints which are not being mounted, and I do think that when the subject has a light background, a thin black border does hold it in nicely and gives it a little added brightness. We have a number of sheets of glass of various standard sizes on which a piece of black paper is stuck about $\frac{1}{4}$ -inch short all round, leaving $\frac{1}{4}$ -inch border of clear glass. This is laid on the print in position and white light turned on, with the result that you have the black border in one exposure. This method, of course, does mean that you have to compose your picture in the enlarger, not allowing yourself any trimming afterwards, but personally I think that is quite a good thing.

Another little dodge is the printing of one's name on the paper by means of a torch. Make a line negative of your signature and then fix it to the end of an ordinary flashlight torch, so that the torch can be pressed on to the paper and then switched on for a second or two, and there is no light escaping to the rest of the print.

On the subject of signatures, I have

seen many prints spoiled by illegible scrawls on the mount. On the other hand, all of you must be familiar with some very artistic signatures. Unless one is heartily ashamed of one's pictures one should try to have some sort of signature, preferably designed in an individualistic style. It is quite pointless to put an illegible scrawl in the corner when it has no artistic value at all and does not even inform people who it was that made the print. I should like to make a plea that all workers, especially those who send their work to exhibitions, sign their prints. All artists sign their work, and we should not be ashamed to sign our work either.

Mr. Mason concluded his lecture by showing a series of slides of his own excellent, mostly commercial, work.

In reply to a question as to a clearing bath after the plain hypo bath, he said that the bath he used was an ordinary clearing bath such as ferricyanide and hypo, with a small amount of potassium bromide. It was exactly the same formula as was given in the *B.J. Almanac* for line work.

The CHAIRMAN, who mentioned that he himself had never tried working in a large area with "Corrector" solution, which he had used only for spotting, commented upon the very interesting and practical talk which Mr. Mason had given, and proposed a vote of thanks to him, which was heartily accorded.

THE STORY OF "MAURINE"

In *American Cinematographer*, May, 1942, an article by Mr. Hal Hall describes how a girl, professionally known as "Maurine," and formerly a "stand-in" for Jeannette MacDonald, became Hollywood's most famous woman portrait photographer. The idea that started it all was that portraits—especially of picture personalities—shouldn't be presented with the old-fashioned, conventional portrait lighting, but given the same treatment to be seen in a motion picture close up photographed by an ace Hollywood director of photography. In four years that idea and that technique have put her on the photographic map in a town where conventional portrait photographers come at less than a dime a dozen. So wonder she advises photographers, professional or amateur alike, to adopt the same method, in other words to study the art of portraiture in its best modern application by going to the neighbouring movie-

house and observing what the masters of motion picture photography do in the way of lighting and posing when they photograph a motion picture star for the screen. From answers to questions put by "Maurine" to leading professional cinematographers about changing in lighting, etc., high key and low key for different moods, etc., she learned a lot about lighting and treatment. She did not question the "still" photographers, because she had an idea that no still photographer ever got the results that were attained by the cinematographers in their close-ups. "Maurine" states in her own words: "Another thing I can't stress too much is the use of make-up. I use it in all of my portraits, and, as a result, scarcely any of my portrait negatives are ever retouched. All the retouching is done with make-up, before the picture is made. This, of course, is doubly important when you're really working with movies, rather than stills."

ANNOUNCEMENTS

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1943 became due on January 1st.

The subscription for Fellows, Associates and Members is £2 2s. 0d.; Group subscriptions, which became due for renewal on the same day, are as follows: Scientific and Technical Group, 7s. 6d.; Pictorial Group, 5s.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s.; Kinematograph Section, 5s.

Group subscriptions may be included with the Annual Subscriptions, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscriptions to the Society through their own Bank to The National City Bank of New York, in New York, or direct to The National City Bank of New York. Such subscriptions should be paid to the Bank for the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square Branch, London, account. Members instructing their Bankers to make the remittance to The National City Bank of New York are requested to ask them to mention their names, addresses and status (Fellow, Associate, Member); and Members making the remittance direct to The National City Bank of New York are requested to give this information.

It is important to note that payment should be made

"For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the same time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

LECTURE PROGRAMME

Friday, November 5th. 6 p.m. Meeting of the Pictorial Group. "The Pictorial Photographer and Colour." By Bertram Cox, Hon. F.R.P.S.

Saturday, November 6th. 3 p.m. Meeting to be arranged by the Colour Group. "Car, Camera and Colour." By R. Binder.

Saturday, November 13th. 3 p.m. "Spanish Architecture." By J. R. H. Weaver, M.A., F.R.P.S.

Saturday, November 20th. 3 p.m. Meeting to be arranged by the Kinematograph Section.

Saturday, November 27th. 3 p.m. "Meditations and Recollections: Fifty Years of Photography." By Charles Eshborn, A.R.P.S.

Friday, December 3rd. 6 p.m. Meeting of Pictorial Group. "Table Top Photography." By E. Heimann, F.R.P.S.

Saturday, December 4th. 3 p.m. Meeting arranged by the Miniature Camera Group. "Review of Literature and Developments of Interest to the Miniaturist." By Percy W. Harris, F.R.P.S.

Saturday, December 11th. 3 p.m. The Traill Taylor Memorial Lecture. "Sensitometric Apparatus for Controlling the Manufacture of Photographic Materials." By E. R. Davies, B.Sc., F.R.P.S.

Saturday, December 18th. 3 p.m. Joint Meeting of the Scientific and Technical Section with the Association for Scientific Photography. Conversation, Exhibition and Demonstration of photographic equipment used for scientific and industrial investigations.

Friday, January 7th. 6 p.m. Meeting of Pictorial Group. Lantern Evening. "My Favourite 100 Slides." By J. Dudley Johnston, Hon. F.R.P.S.

Saturday, January 8th. 3 p.m. Meeting of Colour Group.

Saturday, January 15th. 3 p.m. Meeting arranged by the Miniature Camera Group. "Composition." By Ricardo.

Saturday, January 22nd. 3 p.m. Meeting arranged by the Kinematograph Section.

Saturday, January 29th. 2.30 p.m. Meeting arranged by the Scientific and Technical Group. Symposium on Microdensitometry and Microsensitometry.

JOINT MEETINGS

Birmingham Photographic Society, York House, Great Charles Street, Birmingham. Tuesday, November 30th. 6.45 p.m. "A Tale of the Seven Seas." By Thomas W. Karran, A.R.P.S. Tuesday, Decem-

ber 14th. 6.30 p.m. "An Historical Review of Colour Photographic Processes." By F. J. Tritton, F.R.P.S.

Bradford Photographic Society, The Science Room, Mechanics' Institute, Bridge Street, Bradford. Saturday, November 27th. 2.30 p.m. "The Camera as a Means of Artistic Expression." By H. Bairstow, F.R.P.S. Saturday, February 12th, 1944. 3 p.m. "Architectural and Record Photography." By J. Crowther Cox, F.R.P.S.

Bristol Photographic Society, The Grand Hotel, Bristol. Saturday, November 27th. 3 p.m. Lecturer: Percy W. Harris, F.R.P.S.

Bath Photographic Society, 13, Lower Borough Walls, Bath. Thursday, January 27th, 1944. "Camera Portraits and their Making." By Arnold Longman, F.R.P.S. Thursday, March 23rd. "Glimpses of the Alps." By Mrs. Emonet, A.R.P.S. This meeting will be held in the Pump Room.

Leeds Camera Club, Leeds Institute, Leeds. Monday, January 10th. "Lower Wensleydale, Past and Present." By H. Bryce Thomson, A.R.P.S.

Nottingham and Notts Photographic Society, Scouts' Hall, Shakespeare Street, Nottingham. Saturday, December 11th. 3 p.m. "Dalmatia, the Coast of a Thousand Islands." By Bernard B. Cox. (Lecture illustrated by Agfacolor Miniature Slides.)

Preston Scientific Society, Photographic Section, Ellesmere Chambers, Church Street, Preston.

Rotherham Photographic Society, The Crofts, Moorgate, Rotherham. Sunday, December 19th. "Against the Rules." A talk by H. T. Smith, A.R.C.A. Sunday, March 19th, 1944. "Approach to Natural History Photography." By Frank Newton.

EXHIBITIONS AT PRINCE'S GATE

November. (1) Diamond Jubilee Exhibition of the Works of Alexander Keighley, Hon. F.R.P.S. (2) Prints by Dr. S. D. Jouhar, F.R.P.S.

December. (1) Photographic Alliance Competition Prints. (2) Colour Photography, arranged by the Colour Group.

January, 1944. (1) Prints by Mrs. K. M. Parsons, F.R.P.S. (2) Prints by Douglas Croall.

Feb. (1) Prints by Members of the Institute of British Photographers.

March. (1) Prints by Members of the Miniature Camera Group. (2) Prints by Lieut. R. G. Fennah, F.R.P.S.

April. Prints by Overseas Readers of *The Amateur Photographer*.

THE PHOTOGRAPHIC JOURNAL

THE OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND
THE PHOTOGRAPHIC ALLIANCE

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DECEMBER, 1943

TWO SHILLINGS
AND SIXPENCE



NORMAN SETTING, WINCHESTER

R.P.S. Annual Exhibition

B. HUTCHINGS, F.R.P.S.



Blue Tit with a large family

A FILMIC APPROACH TO NATURE STUDY

By John Chear, F.L.S., M.B.O.U., F.R.P.S.

At the Joint Meeting of The Royal Photographic Society and the Birmingham Photographic Society, held at York House, Birmingham, on March 9th, a lecture bearing the above title and a display of films were given by Mr. John Chear, F.L.S., M.B.O.U., F.R.P.S. The Chairman of the Cine Section, Mr. F. Wakeman, occupied the chair.

MR. CHEAR said that first of all he would like to say how pleased he was to be able to visit the Birmingham Society again and to convey to them the greetings of The Royal Photographic Society.

The policy of these joint meetings seemed to be one which, though a war development, should be continued after the war as a means of bringing together The Royal Photographic Society and the other Societies in a way which cannot be but to their mutual advantage.

Uses of the Filmic Approach

In considering the application of the cinematic process to Nature Study, it is well at the outset to take a utilitarian point of view and commence with the uses of that particular line of approach.

It seems that they can be summarised as follows:—

- (a) Observation at second hand where direct observation is difficult.

- (b) Planned observation, such as:
 - (i) Of events in a life cycle, placed in proper relation to each other, e.g., a bird's life history.
 - (ii) Altering the time scale, e.g., speeding up movements.
 - (iii) Selection of observations to cover a piece of natural life, involving a community of wild birds, e.g., a woodland.
 - (iv) Selection of observations to show effects of environment on life, e.g., the adaptation of birds to life on water.

Limitations

At the same time, it is well to keep in mind that there are certain limitations to the effectiveness of cinema in Nature Study. These may be summarised in this way:—

- (a) The film must always be based on the known and progress towards new facts. The film should be sound, educationally and biologically; the audience must have a point of contact with their own experience.
- (b) The visual appeal of the film, i.e., of second-hand observation, serves to impress the result of study, but cannot take its place. The film is an aid to, rather than a means of, education.

General Approach

Having defined what one can do, it is well next to consider what should be the general approach of films to Nature.

Films of Nature should provide the basis of regarding Nature as an open book for those who cannot read; not treating natural things as mysteries—the closed book. For instance, in the case of adaptations to environment arising in the course of evolution, they are generalisations which could have been expected on a reasonable common-sense basis, e.g., diving birds have:—

(1) Webbed feet far back for propulsion. It is quite obvious on anatomical principles that feet placed back in relation to the body as on the water will give greater power than if they were placed further forward as in the case of birds.

(2) Small strong wings for swimming under water—a medium of greater resistance than air, therefore, not needing the same area of vane.

(3) Feathers close and naturally oiled to prevent wetting.

Photographic Approach

The methods of Nature

thers are as various in detail as number of photographers, but the realist purpose must over-ride the e; photography is the means he end. The purpose of the film be in view from the first and the of the shots subordinated to it. re films are a mode of expression e person who is at the same time turalist and a photographer and marry his two interests to pro- something of value to the com- ity as a whole. They are a means ing art—a method of expres- oneself—to the service of scien- interest—generally of people at.

All films (and Nature films o exception) are an outlet for the ive instinct which, in modern inds no expression in many kinds ormal work. After planning a film, making a great many efforts rry out the original design, with additions which might have red to one as improvements, after finally completing the work unity, the sending of it out with essage to the audience is like ng a child into the world.

e film must create a chord of athy between itself and the nce. It does this best by pro- g a connection between the ience of their own lives and the n. There is in a very large on of British audiences a definite of birds, and therefore a bird as that initial advantage; but oject beyond the experience of udience, e.g., a rare bird, is not ch appeal as one extending their ience and increasing the signifi- e of those birds of which they something.

seemed good advice to give to ur cinematographers for use in lays when films could be ob- d and when war-time restric- on photography were removed, ake films around themes and cts with which they were really iar and in which they would a double interest, photographic ith subject matter.

e first film he would show, rybody's Birds," was one on rial which, as the lecturer lived arden City, was to his hand; as re—the effect of the increase of ns in this country on bird life. was the main theme. It should bserved that in gardens the ty of bird population may be as as thirty to the acre, whereas on land, on an average, it does not ove one bird to two acres. The d and subsidiary theme was to ate the life histories of three hich have adapted themselves ularly to garden life; the blackbird and blue tit. Of

these, the blackbird is one of the two commonest birds in England, and the robin one of the two next common. The garden had therefore three advantages:—

(1) It was near; and in order to carry through a film of a certain environment one had to be there frequently over a considerable period.

(2) A garden contains some of the most colourful English birds as well as some of the commonest, well known to everybody, and from which one could draw conclusions that most people would appreciate.

(3) It provided a theme both of general application in natural life and on a social topic.

The first aspect of the theme was that the birds which succeeded were those which had adapted themselves to what was the biggest factor, perhaps, in the totality of factors affecting natural life in this country, i.e., man's interference. The birds which were intolerant of man and retired to the wilds got compressed, decreased in number and were gradually pushed out, whereas those which made friends with the interferer, as the garden birds did, had a better time and increased in number.

Adaptability was a great key to success among natural forms. Man himself had succeeded in competition with other animals largely because of his great adaptability. And among the human kingdom adaptability was a giver of great advantage to its

possessor. It was a principle at variance with extreme specialisation.

The other aspect of the theme was the significance of the English love of gardens, in promoting not only a healthy life, but in promoting an increase of our birds.

At this point, "Everybody's Birds," which covers the lives of three pairs of birds, a pair of robins, a pair of blackbirds, and a pair of blue tits, in the garden for six months, was projected.

The lecturer said there was a real thrill when a robin fed her youngsters while they rested on his hand (particularly when he had not coaxed her to do so) and when the blackbird allowed his finger to stroke her in the nest. How that happened he did not know—Mr. Chear had no claims to any magnetic force—the bird built in a hedge with people continually passing by. Probably also it was necessary to approach her with a certain amount of confidence to gain hers—a principle well known to those dealing with animals.

The film was in colour, and here the amateur seemed to be at an advantage with the professional, for he had the use of the Kodachrome process. The professional seemed confined to Technicolor, which probably needed more elaborate apparatus, with the probability of more disturbance to the birds. Apart from its great value for identification, colour gives



Robin on its way to feed the family



Outside the Béguinage, Bruges

BRUGES IN AGFACOLOR

By J. E. Hall. F.R.P.S.

A JOINT meeting of The Royal and Birmingham Photographic Societies, held at the headquarters of the B.P.S., York House, Birmingham, on Saturday, December 5th, 1942, the President, Mr. G. Bernard Mason, in the chair, was devoted to a lecture, "Bruges in Agfacolor," by Mr. J. E. Hall, F.R.P.S., Hon. Treasurer of the Society.

The lecturer has made periodic visits, since 1905, to the "Venice of the North," but it was not until 1937 that he found himself able to exploit the possibility of rendering its varying and lovely tints in Agfacolor Flat Film. Three journeys in 1938 and another in 1939 provided further opportunities for registering effects recording each of the seasons; the idiosyncracies of Hitler necessitated hurried returns to port, but conditions were in other respects ideal, a fact proved by a long hundred slides rigorously selected from the exposures safely passing the Customs. They illustrate phases of the best of the city's architecture, of its bridges, quays, ramparts, and comprise numerous canal scenes, interspersed with ecclesiastical and other interiors.

Beginning with a short general description of the ancient Flemish City, a luscious orgy of colour depicted tree-shaded squares, luminous with the glints of spring sunshine, medieval buildings enriched by step gables and dormer windows, delight-

ful vistas of derelict canals beyond the city gates. A passing reference to the persistence of smells amid such a multiplicity of canals was happily succeeded by a detailed survey of the most famous of Bruges's architectural gems: the Belfry, the Cathedral, the Church of Notre Dame, St. John's

Hospital, the Gruuthuse Manor House, the Town Hall.

Romance was not forgotten. A visit to the entrancing Lac d'Amour—Lovers' Lake—introduced the story that a sip of its water made one irresistible to the lady of one's choice, and two hearts were eternally bound together. Then there was a ghastly story connected with the monastery and nuns' convent in the Augustinian quarter of the city, a quarter where the lecturer had spent many a happy *quinzaine* associated with an almost perfect cuisine and service at moderate cost. Each day was ushered in with hot rolls, delicious un-rational butter, non-synthetic coffee—which was an ecstatic pleasure to escape, for a time, from the stodgy, fulsome, body-building, temper-destroying English breakfast! The convent witnessed centuries ago, a sacrilegious crime, the murder of a beautiful chaste novice by a monk, devoured by tragically lustful love. This strange event was re-enacted years later when, with the aid of a medium, the re-incarnated monk confessed the details of the murder in the chapel and the burial of the body in the cellar. The next day the murdered nun, dressed in white, and holding in her hands a crucifix pressed to her breast, showed herself in the cloister, and immediately disappeared. It is said that there are occasional re-visitations of the originals in what is now a large private residence, but on this the present occupier preserves a strict neutrality.



Hôtel de Ville, Bruges



Greater Spotted Woodpecker

film, which was again in was then projected with a ntary by the lecturer linking incidents with the general les in his preceding talk. The oved forward on a seasonal aking the audience through the howing the outstanding fea-f a woodland and its life from imencement of one year to the

al Basis

hear pointed out that this film signed, as indeed have been all ns, to emphasize the com- view of natural life. Birds, mple, could no more live in n than human beings, and the om which many of his bird eveloped was to show the life communities and consider the tion between bird communities man society. In the film just however, the community idea tended to cover the basis of tion between plants in a wood- ach of which had to fit in as it ith the habits of the others. r, the idea reached its full ment in the consideration of nt, insect, bird and animal nities as one whole association g forms.

lly, the lecturer said it had een his particular care that should suffer through having d, through his camera, a e into its life. Bird photo- rs should be especially careful ve the test that if either the photograph had to suffer, ld always be the photograph. never be said justifiably that d photographer is a menace to ds.



Chaffinch feeding young

Mr. WARWICK rose to propose a hearty vote of thanks to Mr. Chear. He said how much he had appreciated the lecture as he was a bird photographer, although not a cine photographer. He was anxious to know a few more technical details and to hear some of the difficulties encountered.

Mr. F. G. RATCLIFFE also said he wished to add his thanks and appreciation. He would also like further information, particularly as to how Mr. Chear managed to adjust the exposure of one particular long panorama shot which embraced the deep shade of woodland to the top of a very high tree. Mr. Chear explained that the camera he used was a Kodak

Special, it had a six-inch telephoto lens, reflex focusing on the gate. He stated that he found no difficulty in keeping birds in focus on the trunk of a tree, even though the depth of focus was small, because they were nearly always in the same plane. The sky background was often a difficulty. He preferred a side light if possible. The mixes were done by means of the variable shutter and the back wind fitted to the camera. He explained how he adjusted the exposure in panning from the bottom of a tree to the top—he closed the diaphragm while panning.

The vote of thanks was passed with much applause, and Mr. Chear replied.

MAKING THE FINISHED PRINT

By R. H. Mason, F.R.P.S., F.I.B.P.

A Meeting of the Miniature Camera Group of The Royal Photographic Society was held on July 17th, 1943, at 16, Prince's Gate, S.W.7. Col. W. Symon was in the chair, and Mr. R. H. Mason addressed the Members on "Making the Finished Print."

MR. MASON spoke as follows. The whole subject of making the finished print is far too complex for one afternoon's discussion, and I can only pass lightly over the more important points of the various processes and endeavour to give you a brief conspectus of the various methods in use to-day. As a professional I have been fortunate in having had the opportunity to try out most methods, and during the course of ten years I have picked up a few hints and tips which may be of use to you. A lecture of this kind is not practical unless it mentions commercial products by name, but I assure you that I have no financial interest in any of them. * ■

I have been interested to note that many photographers, especially miniaturists, will spend hours in getting a perfect negative, but after that they take no trouble at all, developing their prints, for example, in very ancient and badly-mixed developer. Having made a mediocre print, they will then spend many hours putting it right, oiling and pencilling, and so on. I should like to tell you how we, as a commercial firm, prepare our prints. When turning out hundreds of prints a day, we must have an economical, but efficient, process. We have a trough about seven feet long, heated by electric bulbs, with thermostatic control, and our entire printing, right from the developer to the final wash, is kept at a temperature of 70°. We use Johnson's standard developer, which is normally diluted 1:7, but we dilute it 1:10. In front of the developing dish we have a small dish in which there is a drop of the concentrated developer. As soon as the print is put in the developer we take a piece of cotton wool soaked in the concentrated developer and when the image begins to appear we smear the cotton wool quickly over any part which is not coming up quickly enough, thus obviating any necessity for control in enlarging. This must be done deftly and quickly, or stains may result.

From the developer our prints go to the rinsing bath for a minute and then into plain hypo—not acid hypo. In front of this we have a little

saucer or dish with a one per cent solution of potassium ferricyanide, and if parts of the image have come up a little too dark a piece of cotton wool is soaked in the ferricyanide solution, the print is lifted out quickly, the portion which is too dark is wiped over, and the print is then plunged back into the hypo. It needs the combination of ferricyanide and hypo to do the work, but the print may get stained if it is kept too long out of the hypo.

After a minute or so the print is taken out, given another rinse, and transferred to acid hypo. Altogether I suppose we spend six or seven minutes in producing a print, which takes very much longer than most amateur prints—and we save ourselves a great deal of after-work in local corrections. The method has also the advantage if the printing is done on glossy paper, on which not a great deal of after-work can be done as on matt. If you get to the hypo bath and find the print not satisfactory in gradation, I would urge you at that time to take your courage in both hands and throw the print away. A great amount of bleaching and re-development, intensifying or reducing, never give you a perfect print, and the print is tonally correct by the time it has reached the hypo bath. It is, of course, possible to bleach and re-develop when it is only a matter of improving the colour.



A black border brightens commercial subjects. The sky has been darkened with concentrated developer during development.

Now we come to the processes we follow after our print is dry. There are, roughly, three categories: (1) those processes which are necessary to cover defects in our printing, such as spotting and knifing; (2) those processes which we use to improve the artistic effect, such things as oiling, local correction and varnishing; (3) actual after-processes, such as Carbro, Bromoil, etc.

To come back to spotting. Formerly we always used I.C.I. naphthylene black, but lately we have taken to using Martin's dyes. Our method of working with these is to take a palette, dip a brush in the Martin's dye (which, incidentally, is always given a drop of Wettol) and transfer one drop of concentrated dye on to the corner of the palette, another drop with some water in a second corner, and to have lesser concentrations in the other corners, giving from dark to light grey. It is always better to use the dye lighter than the surrounding tone of the spot which it is desired to fill in and then work it up. I know some workers who work it the other way by having a spot of concentrated dye and getting the brush extremely dry, but it seems a risky business, because it is easy to get the spot a bit too dark and then it is difficult to lighten it again. In the case of glossy prints, a little spirit gum is added to the dye, so that there is a slight gloss on it and it is quite impossible to see where there have been spots. With the naphthylene black we used previously, it was possible, particularly against the light, to see the spots.

In the case of large spots these dyes are not so good, largely because they have a distinct blue tinge after they dry, which does not match the surrounding area. This is important in the case of very small spots, but in a large spot it is quite apparent. For that reason we go back to water colour. It is not advisable to use oil colour, because it will come off if the print is afterwards doped.

So much for white spots. We now turn to the removal of black spots. The usual method is to use potassium ferricyanide on the tip of a brush and bleach it out, usually using one drop and blotting it off immediately, then another drop, and so on, until the required tone is reached. I, personally, prefer Ilford "Corrector" solutions, which are not made for that purpose, but to correct line photographs. By diluting No. 1 solution with about twice the quantity of water and applying that with the brush, you remove the spot and you have only to give a quick wipe over with a piece of cotton wool soaked in the No. 2 solution and the action is



A print produced from an enlarged paper negative and printed through the paper. The original negative was 35 mm.

stopped immediately and no further work is necessary, whereas if ferricyanide is used it is necessary to wash the print afterwards.

Another disadvantage of ferricyanide is that it is apt to spread and leave a halo, whereas the "Corrector" solution seems to retain itself in the brush very much better.

Another common trouble is "tram lines." I have never found a really satisfactory method of removing them. I have tried running a bleacher along with a very fine brush, but I have never yet been able to keep to the line. The only way to remove them seems to be with a knife, and the knife requires considerably more skill than I possess, but one of our retouchers says that the secret is to work with light strokes slightly at an angle to the "tram line." There are some surfaces of

paper which take the knife very much better than others, so this does not always work.

We have now brought the print to the best stage we can get it without any artistic embellishments. We should now have what is virtually a perfect print, especially if it is a glossy paper print. So we come to oiling, or "doping" as it is often called. It will be necessary before starting, for the worker who has not done any bleaching or intensifying in the development stage, as I have described, to do his local corrections first. When any local work that is necessary has been done, the print should be dried and wiped all over with a medium. Practically every article I have seen on oiling prints gives a medium composed of one part linseed oil, one part mastic varnish, and two parts turpentine. I use the

same except that I have only one part of turpentine. With two parts of turpentine it dries too quickly for my working. This medium should be fairly liberally applied with fluffless cotton wool, and the print should be left for about half an hour before any more work is done on it. Black and brown oil colours are now mixed to match the tone of the print and applied by means of fluffless cotton wool, very little at first, and afterwards going over it again a little harder and then harder still, until, finally, we have put on a good coat of paint, which is evenly spread by rubbing until the print looks like a November fog. The highlights are now cleaned up with pledges of cotton wool, or artists' stubs, until the desired brightness is obtained. The only real tip I can give you in the application of the oil paint is to be liberal with it. I advise you to "slap it on." If you are going to dry mount your print, leave it for at least a week, otherwise you will find that the heat will remove the sheen, but it can often be restored by an application of Printamol.

There are a lot of other methods, but most of them require much more artistic skill than most of us possess, and I find oil paint just as effective. With oiling, the paper surface has quite a lot to do with the result. I have always found that Kodak Royal and Ilford Lustre papers take oiling very much better than most others. There is a tendency in some papers for the paper grain to appear when the oil paint is applied, with the result that where the oil paint is applied lightly you get a strong paper grain, and where the oil is applied liberally, no grain at all, and the effect is very unpleasant.

I will mention a few of the other processes which are interesting. The first of these is Transferotype paper. I am surprised that this paper is not used more. It is so simple and easy to transfer to an extraordinary variety of surfaces. One of my treasured possessions is a parchment lampshade on which I have printed a dozen portraits of friends of mine by Transferotype, and they have stood up now to the heat of the lamp for some years and still look nice. Another advantage of Transferotype paper to the miniaturists is that by transferring on to a rougher surface quite a lot of grain which you were not able to lose in your negative is concealed by the paper itself.

I should like to mention the enlarged paper negative process. These are very simply made and for the miniature worker they are ideal. Our method is to make a print on single-weight paper to the size we

require the final print to be, and after washing, soak it for ten minutes in a five per cent solution of glycerine. The print will then dry without any cockling or warping. As soon as it is dry any retouching desired can be done. This must be done by translucent light, with pencil or charcoal on the back of the print. You then make a negative by printing in contact, that is, emulsion to emulsion, and in the same way you should, after development of this negative, soak it in glycerine and avoid any warping or shrinkage in drying. You must, of course, dry it off naturally.

Anything that is found to be too light on the original print can be darkened quite easily by pencilling on the back of that print, and now on

pleasant intensification of blacks and a very rich deep effect as well as accentuation of the surface of the paper. For that very reason brom-etching is not very effective on some papers. I got in touch with Major Harbutt, of Somerset, who has made some delightful brom-etchings, and he told me that he works exactly as described in the *B.J. Almanac* for 1943, except that he gives about four times the normal development instead of two. I should explain that the method of working it is this. The correct exposure is found for the print by test strip, and then you give three or four times that exposure. In the *B.J. Almanac* it says you should then develop for two times normal development, but the worker



* "Bromatrad" print on Ilford Royal Lustre



One of a series of portraits printed on Transferotype paper and transferred to a parchment lampshade

the reverse side of your negative, anything too dark in the first place can be lightened. From that paper negative you can make your print either by printing emulsion to emulsion or with the emulsion away, that is, with the light coming through the paper before it reaches the emulsion. By the second method you get a slight softness which in pictorial subjects is very pleasing. You will get more paper texture showing, but the paper texture, if the paper is of good quality, is pleasant and quite effectively conceals any negative grain you might have in the first place. I would particularly recommend paper negatives to miniaturists, especially 35 mm. miniature workers in portraiture, because there is nothing easier than retouching on these enlarged paper negatives.

A process of which I am very fond is brom-etching. This is a process in which the image is forced deep into the emulsion and the result is a very

I have just quoted develops at least four times, and sometimes six times, normal development.

After rinsing, the print is transferred to an etching bath made of common salt, sulphuric acid and potassium permanganate, and the high lights begin to clear away. What was a dead black print begins to look like a photograph. It has, however, to be applied in small doses. As soon as it gets into the hypo it clears amazingly and you see the print in all its richness and full black tones. Only one or two papers are really satisfactory for brom-etching, notably Old Master and Rough Lustre.

I would like to mention a few uses for Rossite resistant. Most of these have a commercial application, but some of you may find them useful. First of all, in advertising, when we want one article to stand out from its background we paint over the article on the print with this Rossite resistant. It is easy to control with a brush, and then you can bleach out or semi-bleach the background or

tone it a different colour, in fact, you can apply a number of variations, and having done that and dried the print you can remove the Rossite by rubbing it off with the fingers and print up your subject to the strength required. In *The Photographic Journal* recently there was an article on Multigrade, describing how the contrast of the main subject and its background could be varied by the use of different filters. On the strength of that article I tried it out, using Rossite as the masking agent on the enlarger baseboard, and it was quite satisfactory. Owing to the hard edges it is not satisfactory for soft focus prints, which reminds me to say a word about soft focus. I, personally, do not like to see a lot of



Printed from a paper negative made by contact from the original whole plate. Paper grain here is not so pronounced

soft focus, and in the case of most soft focus lenses which are used for enlarging, I always think the softness is overdone. When we require soft focus—which is not often—we merely get a piece of cellophane, crumple it up, and flash it under the enlarger lens for about half the total exposure. It is just enough to get rid of the graininess of the negative when using glossy paper. Quite often also I notice a number of printers get soft focus effects by blowing smoke in varying designs under the enlarger lens. I do not recommend blowing it at the lens, or condensation may occur.

On the question of mounting, there is only one piece of advice that I would give, namely, that it should be simple. I have never yet known a nice juicy steak which was made any juicier by being served on two plates, one on top of the other, and yet I notice prints on two or even four mounts. I have not yet seen a good

print which has been spoiled by being mounted on a piece of plain white card without any coloured borders or fancy effects. Nearly all the best workers, our really leading photographers, mount their prints straight on to white card without any elaboration whatsoever. I am rather fond of narrow black borders, particularly with glossy paper prints which are not being mounted, and I do think that when the subject has a light background, a thin black border does hold it in nicely and gives it a little added brightness. We have a number of sheets of glass of various standard sizes on which a piece of black paper is stuck about $\frac{1}{8}$ -inch short all round, leaving $\frac{1}{4}$ -inch border of clear glass. This is laid on the print in position and white light turned on, with the result that you have the black border in one exposure. This method, of course, does mean that you have to compose your picture in the enlarger, not allowing yourself any trimming afterwards, but personally I think that is quite a good thing.

Another little dodge is the printing of one's name on the paper by means of a torch. Make a line negative of your signature and then fix it to the end of an ordinary flashlight torch, so that the torch can be pressed on to the paper and then switched on for a second or two, and there is no light escaping to the rest of the print.

On the subject of signatures, I have

seen many prints spoiled by illegible scrawls on the mount. On the other hand, all of you must be familiar with some very artistic signatures. Unless one is heartily ashamed of one's pictures one should try to have some sort of signature, preferably designed in an individualistic style. It is quite pointless to put an illegible scrawl in the corner when it has no artistic value at all and does not even inform people who it was that made the print. I should like to make a plea that all workers, especially those who send their work to exhibitions, sign their prints. All artists sign their work, and we should not be ashamed to sign our work either.

Mr. Mason concluded his lecture by showing a series of slides of his own excellent, mostly commercial, work.

In reply to a question as to a clearing bath after the plain hypo bath, he said that the bath he used was an ordinary clearing bath such as ferricyanide and hypo, with a small amount of potassium bromide. It was exactly the same formula as was given in the *B.J. Almanac* for line work.

The CHAIRMAN, who mentioned that he himself had never tried working in a large area with "Corrector" solution, which he had used only for spotting, commented upon the very interesting and practical talk which Mr. Mason had given, and proposed a vote of thanks to him, which was heartily accorded.

THE STORY OF "MAURINE"

In *American Cinematographer*, May, 1942, an article by Mr. Hal Hall describes how a girl, professionally known as "Maurine," and formerly a "stand-in" for Jeannette MacDonald, became Hollywood's most famous woman portrait photographer. The idea that started it all was that portraits—especially of picture personalities—shouldn't be presented with the old-fashioned, conventional portrait lighting, but given the same treatment to be seen in a motion picture close-up photographed by an ace Hollywood director of photography. In four years that idea and that technique have put her on the photographic map in a town where conventional portrait photographers come at less than a dime a dozen. No wonder she advises photographers, professional or amateur alike, to adopt the same method; in other words, to study the art of portraiture in its best modern application by going to the neighbouring movie-

house and observing what the masters of motion picture photography do in the way of lighting and posing when they photograph a motion picture star for the screen. From answers to questions put by "Maurine" to leading professional cinematographers about changing in lighting, etc., high key and low key for different moods, etc., she learned a lot about lighting and treatment. She did not question the "still" photographers, because she had an idea that no still photographer ever got the results that were attained by the cinematographers in their close-ups. "Maurine" states in her own words: "Another thing I can't stress too much is the use of make-up. I use it in all of my portraits, and, as a result, scarcely any of my portrait negatives are ever retouched. All the retouching is done with make-up, before the picture is made. This, of course, is doubly important when you're really working with movies, rather than stills."

same except that I have only one part of turpentine. With two parts of turpentine it dries too quickly for my working. This medium should be fairly liberally applied with fluffless cotton wool, and the print should be left for about half an hour before any more work is done on it. Black and brown oil colours are now mixed to match the tone of the print and applied by means of fluffless cotton wool, very little at first, and afterwards going over it again a little harder and then harder still, until, finally, we have put on a good coat of paint, which is evenly spread by rubbing until the print looks like a November fog. The highlights are now cleaned up with pledges of cotton wool, or artists' stumps, until the desired brightness is obtained. The only real tip I can give you in the application of the oil paint is to be liberal with it. I advise you to "slap it on." If you are going to dry mount your print, leave it for at least a week, otherwise you will find that the heat will remove the sheen, but it can often be restored by an application of Printamol.

There are a lot of other methods, but most of them require much more artistic skill than most of us possess, and I find oil paint just as effective. With oiling, the paper surface has quite a lot to do with the result. I have always found that Kodak Royal and Ilford Lustre papers take oiling very much better than most others. There is a tendency in some papers for the paper grain to appear when the oil paint is applied, with the result that where the oil paint is applied lightly you get a strong paper grain, and where the oil is applied liberally, no grain at all, and the effect is very unpleasant.

I will mention a few of the other processes which are interesting. The first of these is Transferotype paper. I am surprised that this paper is not used more. It is so simple and easy to transfer to an extraordinary variety of surfaces. One of my treasured possessions is a parchment lampshade on which I have printed a dozen portraits of friends of mine by Transferotype, and they have stood up now to the heat of the lamp for some years and still look nice. Another advantage of Transferotype paper to the miniaturists is that by transferring on to a rougher surface quite a lot of grain which you were not able to lose in your negative is concealed by the paper itself.

I should like to mention the enlarged paper negative process. These are very simply made and for the miniature worker they are ideal. Our method is to make a print on single-weight paper to the size we

require the final print to be, and after washing, soak it for ten minutes in a five per cent solution of glycerine. The print will then dry without any cockling or warping. As soon as it is dry any retouching desired can be done. This must be done by translucent light, with pencil or charcoal on the back of the print. You then make a negative by printing in contact, that is, emulsion to emulsion, and in the same way you should, after development of this negative, soak it in glycerine and avoid any warping or shrinkage in drying. You must, of course, dry it off naturally.

Anything that is found to be too light on the original print can be darkened quite easily by pencilling on the back of that print, and now on

pleasant intensification of blacks and a very rich deep effect as well as accentuation of the surface of the paper. For that very reason brom-etching is not very effective on some papers. I got in touch with Major Harbutt, of Somerset, who has made some delightful brom-etchings, and he told me that he works exactly as described in the *B.J. Almanac* for 1943, except that he gives about four times the normal development instead of two. I should explain that the method of working it is this. The correct exposure is found for the print by test strip, and then you give three or four times that exposure. In the *B.J. Almanac* it says you should then develop for two times normal development, but the worker



* "Bromachad" print on Ilford Rough Lustre



One of a series of portraits printed on Transferotype paper and transferred to a parchment lampshade

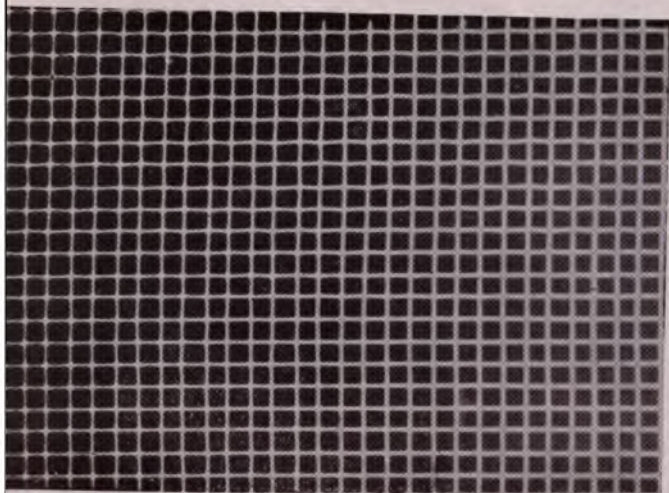
the reverse side of your negative, anything too dark in the first place can be lightened. From that paper negative you can make your print either by printing emulsion to emulsion or with the emulsion away, that is, with the light coming through the paper before it reaches the emulsion. By the second method you get a slight softness which in pictorial subjects is very pleasing. You will get more paper texture showing, but the paper texture, if the paper is of good quality, is pleasant and quite effectively conceals any negative grain you might have in the first place. I would particularly recommend paper negatives to miniaturists, especially 35 mm. miniature workers in portraiture, because there is nothing easier than retouching on these enlarged paper negatives.

A process of which I am very fond is brom-etching. This is a process in which the image is forced deep into the emulsion and the result is a very

I have just quoted develops at least four times, and sometimes six times, normal development.

After rinsing, the print is transferred to an etching bath made of common salt, sulphuric acid and potassium permanganate, and the high lights begin to clear away. What was a dead black print begins to look like a photograph. It has, however, to be applied in small doses. As soon as it gets into the hypo it clears amazingly and you see the print in all its richness and full black tones. Only one or two papers are really satisfactory for brom-etching, notably Old Master and Rough Lustre.

I would like to mention a few uses for Rossite resistant. Most of these have a commercial application, but some of you may find them useful. First of all, in advertising, when we want one article to stand out from its background we paint over the article on the print with this Rossite resistant. It is easy to control with a brush, and then you can bleach out or semi-bleach the background of



Transition from a sharp picture (of a wire mesh) to a blurred one; the scattered light, over increasingly wide areas with increasing exposure, narrows the shadows. Towards the end there are noticeable circles at the intersections; they represent zones of increased protection against scattered light, which is intercepted from two directions

curves of Fig. 3 were obtained by the device, but no ground glass applied; the stop near the bulb 1 cm. wide; thus the curves of represent the type of unsharpness caused by the finite size of the spot of an X-ray tube; d_1 and d_2 for two times of exposure

spreading of the image has its effect on the resolution of a fine pattern. Resolution decreases with increasing exposure, since increasing exposure brings out increasingly faint sections of the "trails" of the pattern curve, thus causing the pattern to clog up while they become increasingly blackening.

It could be realised that the use of a number of lines distinguishable in a unit area as a criterion of the resolution loses its validity as soon as blurring comes in, weak exposure resolving more lines than strong exposure. Thus the criterion of resolution is not invariant with the exposure, as long as any spreading occurs.

The resolution is a function of exposure as well as of the nature of the emulsion (or intensifying screen, etc.). In an ideal non-scattering emulsion, however, the test would only measure the ability of the eye to detect a pattern.

Fig. 5 shows the transition from a sharp picture (of a wire mesh) to a blurred picture. It is a radio-

graph, taken with a thin sheet of celluloid, coated with a yellow dye-wedge interposed between intensifying screen and film; while the dense end of the wedge allows almost no blue fluorescent light to pass to the film, the more transparent parts of the wedge admit increasing amounts of blue light to the film, so that the image beneath the dense parts of the wedge is a simple X-ray picture, whilst towards the other end it becomes increasingly a blue light-picture. The influence of the blue light spreading over the shadows (the wires of the mesh) is obvious; it is towards the thin end of the wedge that the shadows become increasingly narrowed, in fact with a fine pattern or with a further increase of the exposure to blue light they would vanish altogether.

Fig. 5 shows the spreading of the radiographic image of a slit formed by two metal rulers; the picture was taken with the aid of an intensifying screen. The protecting lead was step-by-step removed from the slit, the different sections thus being exposed for increasing times, ranging from one end to the other, over a ratio of 1:16. The spreading of the image is obvious.

Fig. 6 shows the influence of blurring upon small shadows. It is the radiograph of two metal pointers; 6a is taken without screen, 6b with an intensifying screen.

Figs. 7a and 7b show a sharp negative and a blurred one—taken with light; the object was a metal plate in which holes of 0.5 mm. width, with spaces between them of the same width, were drilled. The five-fold increase of exposure in 7b accounts for



Fig. 5. The blurred image of a slit spreads with increasing exposure. The times of exposure were varied in the ratio 1:16

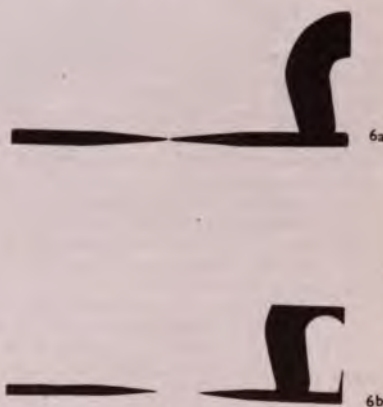
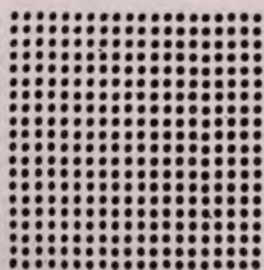


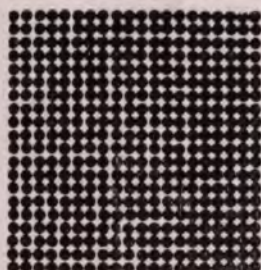
Fig. 6. The blurred image of a shadow narrows with increasing exposure; the ends of the pointers disappear on the picture taken with screen (6b) but are clear in picture 6a, taken without screen

6a is taken without screen, 6b with an intensifying screen.

Figs. 7a and 7b show a sharp negative and a blurred one—taken with light; the object was a metal plate in which holes of 0.5 mm. width, with spaces between them of the same width, were drilled. The five-fold increase of exposure in 7b accounts for



7a



7b

Fig. 7. 7a and 7b represent photographs (negatives) of a grid taken with different times of exposure (1 : 5); increased exposure (7b), resulting in higher densities outside the holes, makes them appear to coalesce

the increased merging of the shadows; the pictures of the grid which was laid on an X-ray film, were taken with the light of a bulb; the beam of light was stopped down so that the resulting unsharpness is only due to the scattering of light within the emulsion itself.

We may formulate a rule concerning the influence of the blurring on lights and shadows in this way: Increasing exposure makes the image of a "light" spread, whilst the image of a "shadow" narrows. Both influences imply a decrease of resolution with increasing exposure.

III.—Measurement of Unsharpness

For different reasons, on which we cannot dwell here, it seems preferable for various purposes to measure the resolution of a pattern instead of measuring slope or extension of the transition curve in order to get a clear insight into the most detrimental implication of unsharpness. An interesting application of the use of the measurement of resolution to determine graininess—one cause of unsharpness—was recently published by Selwyn (2).

I am giving here a brief account of the principle of a method which I am using to measure definition of films and screens. Consider the *sharp* picture of a grid laid on a photo-electric cell, and lit up by a source of light: The photo-electric current which is caused to flow is only a function of the flux of light through the total of the "shadows" (i.e., the transparent parts of the image) if the lights (the holes of the grid) are blackened so much that they do not contribute to the photo-electric current. Thus the current measured is to be considered as a mere "shadow-current." With any *blurring*, however, coming into the picture, the shadows lose transparency on account of light spread. This drop of transparency of the shadows, corresponding to the drop

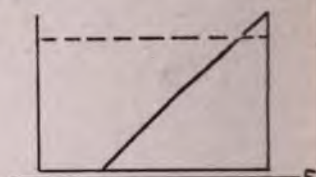
of the "shadow-current," can be converted into the corresponding intensity of stray light which reaches the shadows; this is done by finding that step of a grey wedge (the image of which is taken simultaneously) which gives rise to the same current as the "shadow-current" with the blurred picture; some precautions, which we do not want to labour here, have to be taken. This method gives the amount of stray light reaching the shadows of a given grid (their width being 0.5 mm. in our case), expressed as a percentage of the full light within the holes which, in our case, have the same width of 0.5 mm.

The grid used was the one shown in Fig. 7. The principle of the method and a device for measuring unsharpness of screens were first developed by two former colleagues of mine, K. Juris and R. Rudinger (3); I have added some modifications to it.

IV.—Interpretation of an Image in Principle

It is a statement very common even in modern textbooks that the scattered radiation diminishes only the contrast, whilst it leaves definition unaffected. Scattered radiation, however, may affect definition as well if certain circumstances favour this occurrence. The same circumstances make for the formation of a "pseudo-picture" by scattered radiation; for an image of some kind is formed as soon as the arrangement of the shading objects together with the distribution of stray radiation give rise to steep gradients of illumination on the plane of projection. Steep gradients near the edges are equivalent to phenomena of unsharpness. Let us consider two typical pictures. Fig. 8b shows (the print of) an X-ray picture of a metal ruler (made up of two separate parts) which rests on the bottom of a water-filled tank at an angle of inclination of 45°, the film being beneath the tank. The picture shows a strange "shadow" near the

lower end of the ruler, which is to be interpreted as a rise of action (on account of an increase in thickness or a change in the number) by any uninitiated



8a



8b

Fig. 8. 8b is the print from an X-ray picture of a metal ruler which was put the bottom of a water-filled tank, at angle of 45° with the horizontal plane, shown on 8a. The "pseudo-shadow" is due to a rather well-defined "gap" in the admission of scattered rays

reter. Actually, however, this shadow is exclusively due to an uneven admission of scattered radiation to the plane of the film; it is near the place of support of the rod, where the admission of the scattered radiation is impeded so much that a high falling-off-rate of illumination is brought about, i.e., a rather well-defined shadow is formed (4).

Fig. 9b shows the X-ray picture of three equally thick sheets of lead 1 mm.—thus absorbing completely the radiation used) which were suspended at different heights of a water-filled tank; the even strong shadow belongs to the lead lying on the bottom of the tank (a), the shadow unevenly lit up to the sheet at a height of 1.5 cm. (b), the weak shadow to the lead on the surface of the water, 15 cm. above the film (c).

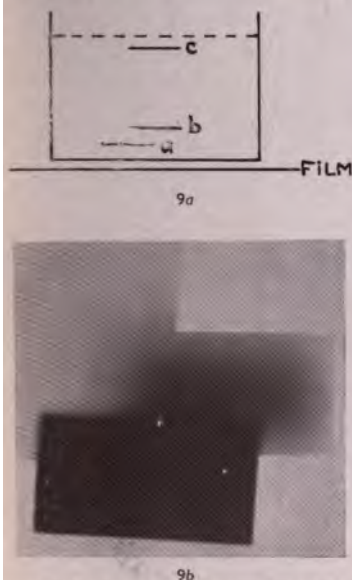


Fig. 9. 9b is the print from an X-ray picture of three sheets of lead, suspended in a water-filled tank at different heights, as shown in 9a. The difference of contrast and unevenness are due to differences in the degree of admission of scattered rays

The differences of "illumination" across the shadows concerned are due to the difference of the admission of scattered light to them. This admission in its turn is dependent on the position of the lead within the scattering medium and on the position of the other shadow-producing objects.

With regard to the influence which differences of admission of scattered radiation exert upon contrast and definition, it is useful to distinguish three types of admission of stray light. Even admission over the whole

area of the shadow amounts to a drop of contrast only (see lead sheet c), definition remains unchanged. Uneven admission with a low gradient of change of illumination leads to the formation of a pseudo-"shadow" (see the egg-shaped "shadow" within the primary shadow of lead b). A steep gradient of admission, however, is equivalent to an impairment of definition; this case is given by the lead close to the film (a): the scattered radiation just spreads over narrow margins near the edges of interest.

As scientific photography develops from a recording method more and more into a method of exploring unknown features, the physically most correct way of interpreting a picture ought to be aimed at. It is not difficult to transfer the knowledge of the influence of scattered X-rays on definition and contrast to actinic light with the principles remaining the same. We must realise that any picture, strictly speaking, is formed by the superposition of the action of two sources of radiation, the picture caused by the primary radiation is superimposed by a "picture" formed by the scattered radiation. The latter need not coincide with the primary picture, and for objects more than a short distance from the film it will degenerate into a general fog.

V.—The Addition of Blurings

This problem seems to me to deserve increased attention, as it is likely to be of first importance in the construction of cameras, as well as of X-ray machines. The degree of definition of an image which should be aimed at must be determined by the permissible blurring which of necessity varies with the object of interest; a greater blur will be permissible for more extensive shadows and stronger contrasts than for fine details and weak contrast. The final blurring on the picture is usually the result of the contribution of different constituents.

The blurring usually attributed to the intensifying screen only is actually made up of two blurrings: one is due to the action of the screen only, the other to the graininess of the film. We are giving but orders of magnitude if we mention that the blur of a screen may be some 20 per cent, whilst the blur of the film would be some five per cent—expressed in terms of percentage of radiation reaching the shadows of the grid, described under III.

Until the beginning of the war it has been assumed even among first-class workers on this subject (5), that the resulting blur is simply the sum of the single blurs—in other words,

that the blurs add as scalars. It is, however, known from spectral-photography, that two broadenings of a line do not add in this way, but that the resulting broadening is the square root of the sum of the squares of the two single broadening values (6). Exactly the same applies to the spreading of an image (say, of a slit) made up by two spreadings. A blur of, say, 0.2 mm. and a blur of 1mm. extension—say, at the intensity of 30 per cent—do not yield 1.2 mm., but 1.04 mm., as the square of 1 and 0.2 are 1 and 0.04 respectively.

It may be of some interest to note that the same law of addition applies to the way in which (as the calculus of probability teaches) probable errors combine: the square of the probable error resulting from the combination of the two errors is equal to the sum of the squares of the errors of the two constituents.

My sincere thanks are due to Professor Mayneord and Dr. Clarkson of the Royal Cancer Hospital, London, for having supported my endeavours with indefatigable care.

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Short Subject Pictures in 16 mm. Colour

In the November, 1942, issue of the *Journal of the Society of Motion Picture Engineers*, Mr. L. W. O'Connell describes a method of photographing professional short subjects pictures on 16 mm. Kodachrome film having edge numbers, and enlarging on standard 35 mm. black-and-white film for the purpose of cutting, editing and viewing in standard 35 mm. studio equipment. The edited black-and-white film is used as a pilot film for cutting the original 16 mm. Kodachrome for colour separation negatives and the subsequent 35 mm. Technicolor release prints.



RAINBOW WEATHER

1845. Oil on Canvas

J.M.W. TURNER

COLOUR PHOTOGRAPHY, PAST AND PRESENT

By T. Thorne Baker, F.R.P.S., F.Inst.P.

A meeting arranged by the Colour Group of The Royal Photographic Society was held at the Gaumont British Theatre, Wardour Street, London, W.1, on May 1st, 1943, when Mr. T. Thorne Baker, F.R.P.S., F.Inst.P., delivered a lecture on "The Historical Background of Colour Photography." The chair was taken by Mr. F. J. Tritton, F.R.P.S. (Vice-President of the Society and Chairman of the Colour Group).

My old colleague of mine who has been at work for, I believe, eight years on the revision of the Dictionary of Applied Photography, told me the other day with satisfaction that he had just finished the index, containing eighteen thousand references. That any attempt to deal with photography is a little like climbing a tree; that only the sketchiest can be given in a short talk; that immense work that has led up to the present state of affairs, to the natural pictures which we see around us.

Years ago I was privileged to see the panchromatic plates for the first time. This was in the Gem Tricolor plate, and was about two years until a superior panchromatic plate was produced by Wratten and Wainwright.

This was in the days when the cyanine dyes had just been introduced, and when the isocyanines were being introduced by Meister and Brünig, Bayer and

It had become possible to get a high red-sensitiveness without the speed or getting in the way of the white spots as one did with the previously available cyanine

The new dyes entirely changed the outlook of colour photography. The cyanine emulsions of 300 H. & D. were produced by the plate makers, and these, sensitised with cyanine, homocyanine, and Orthocyanine, gave for the first time practical panchromatic plates which an exposure of a twenty-second could be given with a lens on a fine day outdoors and the red filter. Newton and I had done invaluable work in the co-ordination of three-colour printing inks and separation of the three as then available, and printing began to get a real push and become adopted on a large scale in illustration.

The most important advance was made by Renwick and Bloch in the use of the power of the yellow

dye, auramin, to enhance the red sensitivity imparted by pinacyanol and to extend the sensitivity further into the red, and I think this point, which was disclosed in two well-known patents (1920), was the actual forerunner of the super-sensitiser. Prior to this, of course, Sir William Pope had done great work in connection with the preparation of the isocyanines, which, owing to the last war, had become unobtainable from Germany.

In a United States patent (2,075,046), Dr. Mees states that it is possible to attain by the addition of certain super-sensitisers to the panchromatising dyes, a higher sensitivity than the sum of their separate effects. Thus, if ten parts of pinacyanol are "super-sensitised" with one part of the yellow dye, pinaflavol, the pinaflavol being in this case the super-sensitiser, the net effect is a speed greater in the region of the two sensitisers than the sum of their effects conferred separately. Add to these effects of super-sensitization the fact that through the study of emulsion chemistry, the knowledge that the sensitive nuclei adsorbed on to the silver halide grains alone need to be dyed, the introduction of new stabilisers, vastly improved emulsion gelatins, the speed of emulsion *per se* enormously advanced, and we can begin to understand how to-day it is possible to expose simultaneously three emulsions one on top of the other in modern colour films, and to obtain snapshots in artificial light in which all three layers are perfectly exposed, and a perfect balance obtained. Irrelevant as it may seem, the manufacturer of photographic emulsion gelatins has played a valuable part in the evolution of colour photography.

It would be impossible to attempt any real glimpse of the unrolling of colour photography without reference to that grand old man, Dr. J. M. Eder. I last saw him at the Technical School in Vienna, some thirty odd years ago, and discussed with him some of the then newer phases of colour photography. Everyone interested in the emulsions which have

made modern natural colour photography possible must be familiar with his classic work, and the enormous amount of experimental work which he carried out in connection with the earlier colour sensitisers. His name, with that of Major-General Waterhouse, and Vogel, must surely top the list of pioneers in this field, which later included such names as Sir William Pope, Dr. Hamer and Dr. Kendal. The introductions of the carbo-cyanines and pseudo-cyanines and of the so-called hyper-sensitisers have been as vital a factor in colour evolution as has the valve in wireless.

The gradual evolution of the art is curiously linked up with that of the dye industry. If you look at the dye tree, this becomes apparent. The dye industry was hardly ready for a good colour matrix at the time when with a repeating back or one-shot camera one could use a colour-blind, orthochromatic and red-sensitive combination. The early matrix plates, as you know, were dreadfully slow. "One second with f/8 in full sunshine" was the tip given to me at Lyons by that other grand old man, *père* Lumière, when I went out to see him in the early days of the Autochrome plate. The coarser matrix of the Versicolor, Paget, Thames, and other screen plates made possible the use of a more coarsely grained emulsion, of correspondingly higher speed, but, as already stated, modern advances in emulsion-making have completely revolutionised the picture, and several years ago the Lumières themselves were able to introduce a fairly fast Autochrome roll film.

The excellent paper given by Mr. Jack Coote at this Society, reproduced in the *P.J.* of June, 1941, is a fine story of the romantic stages through which the camera has passed and of the way in which it has right up to the present time vied with any new type of colour process. Time does not permit of more than mentioning such pioneers as Cros, Ives, Edwards and so on, but I have a soft spot in my heart for the designs of Mr. Butler, because in 1905, the date of his English patent 4290, he came often to see me at the old Gem Dry

Plate Works, at Willesden Green, where we made for him many combinations of plates which collectively would cut down the exposure to a reasonable figure.

It is easy to understand how in the early years of this century, when really fast green-and red-sensitive plates and flat films had become available, the man making three-colour negatives should turn his thoughts to the possibility of a pack of the three sensitive materials in contact. Obviously two plates emulsion to emulsion, with a thin film between them, was the happiest arrangement, but thin gelatin filters were needed in addition. An ordinary plate faced the lens; behind it was an orange filter; behind that an orthochromatic film. If a purely red-sensitive plate were used, i.e., with a gap in the green part of the spectrum, then no other filter was needed. But if a pan plate formed the back member of the pack, then a red filter was needed behind the ortho. film. Unfortunately since the red-sensitive plate gave the cyan (or blue-green) positive, which provides the contrast and definition very largely, it was poor technique to have it at the back of the pack, as it would be somewhat out of focus when working at large aperture.

Many combinations have been tried, and while in later years the lack of definition and bulkiness of a tri-pack has been largely eliminated by the new art of coating three layers of emulsion in optical contact, it must be recorded that much excellent work is being done with the Defender tri-pack in America, especially in the larger sizes of portraiture.

During these early years the birth of the matrix system was witnessed—a microscopic analysis on Clerk-Maxwellian lines of the camera subject, photographed through very small elements of the three primary colours. Originally in the form of lines, I show on the screen one of Professor Joly's early colour pictures, made up of lines about 0.12 millimetre in width. McDonough, I believe, reduced the width of the lines by about one third, and in the later Warner Powrie process, using dyed lines of bichromated, gluc or gelatin, it was again very greatly reduced.

The printed screen led the way to the lithographed matrix. I have an example of a Paget screen plate—a copy of a painting—and if you bear in mind the size of the elements and then inspect an Autochrome, it will be appreciated how much finer is the texture of the latter. Such processes as the Thames and Omnicolor and the considerable work of Mr. Finlay must be remembered.

There has been a marked 'come-

back" to the one-shot camera in view of journalistic colour photography. In America I found most of the successful professional photographers interested in pictures for reproduction in newspapers using a Devin, Bermpohl, Curtis or other camera, as they could make up a wash-off relief or Carbro enlargement to show prospective editors, and hand over immediately to the engraver the separation negatives of any subject accepted. Curiously enough, an American editor will rarely buy a small colour transparency—he insists on seeing a 10in. x 8in. enlarged print from it before he can make up his mind.

Many provincial newspapers there have a three- or four-colour news Sunday supplement, and the largest proportion of films used seem to be 10in. x 8in. Kodachrome transparencies. I had a year's experience in America on the *Trenton Times*, of New Jersey, where Kodachromes would often come in as late as Thursday, and the pictures would be on the four-colour offset rotary machines by Saturday morning. I am convinced by the popularity of the colour news supplements that they will have to be adopted on a wide scale in this country.

All through the evolution of colour photography we find evidences of the influence which photo-engraving has had on the art.

The key, or black-and-white image, is to-day regarded of such prime importance that Morse and Murray in America have devised a photo-electric scanning machine for building up a perfect key negative by combining theoretically computed components of the yellow, magenta and cyan printers. A fourth image is common in all offset and photogravure processes, and, as I say, will be an integral part of the highest class paper print methods of the future, until, of course, the ideal one-exposure printing paper is produced.

To turn now to motion picture work; in the diagram on the screen we may regard the left-hand top diagram as indicating alternative exposures in blue-green and orange-red, which are recombined on the screen by alternate projection; this naturally involves thirty-two pictures per second. The right-hand top diagram shows the beam-splitting prism, as used in Technicolor, while the lower diagram shows a means of obtaining three images by means of two prisms, as was used by Sanger Shepherd in his later model one-shot cameras. The next slide shows frames of the Kinemacolor film, and the next one side-by-side frames of the double

width film used by Cinechrome, also an additive process.

Intermediate between additive and subtractive methods we might consider the lenticular systems, which can still give as perfect colour rendering as any other method; unfortunately their duplication has been a great stumbling block, though it is interesting to know that experimentation is still in progress in this direction.

The early Kodachrome process of subtractive motion picture work, originated by Capstaff about 1913, was based on the selective action of certain dyes for hardened and unhardened gelatin—really a development of the work on the action of dichromates and its applications, of Howard Farmer, Manly and others.

The Kodak Company have very kindly mounted up some frames of two-colour Kodachrome, which are seen in the next two slides.

Traube's Uvachrome process appeared about the same time as Capstaff's early work, and I am able to show one of the Uvachrome results through the kindness of Messrs. Newton and Co. The total number of processes of a subtractive character, involving dye-toning, metallic toning and so on, runs into astonishing figures, impossible to attempt even to mention in our limited time.

In the early thirties the position was somewhat as shown in the table on the screen. But through the filigree of early processes of varying degrees of successfulness there is one outstanding name, that of Friese-Greene, which must be recorded. I often think that it was more by ill-luck or lack of opportunity that Friese-Greene did not figure in a far more spectacular manner amongst the giants of colour cinematography.

Louis Dufay was the first to apply the screen-plate or colour mosaic idea to motion pictures. (It must also be remembered that Finlay also produced some films at a little later date.) His Versicolor plate will be remembered; this was made by lithographically printing the coloured screen elements on to glass, and Dufay must always be thought of primarily as a photo-mechanical expert. I went to his laboratory in Versailles in 1927 to advise in the matter of emulsions, for he was at that time obliged to give a quarter of a second's exposure for each cine frame. This first visit resulted in a close collaboration with M. Dufay and his engineer, M. Bonamico, later cemented by the generous support of Spicers Limited, and in 1930 we were able to give a show of really creditable colour films at a *Conversazione* of the Royal Society. I don't think that

more natural colours have ever been seen since. It looked as though perfection had been attained, but, alas! three-fourths of the pictures were reversed originals, a fourth only were copies. In duplication great difficulties were experienced owing to the considerable spectral overlap of the blue-violet, green and orange colours of the matrix and the consequent dilution of the colours in the prints.

By the use of cadmium mercury vapour light and a didymium filter (the next slide shows the absorption of a Corning didymium pot glass) the overlaps were largely avoided. Refined sensitometric work and emulsion sensitising, and a great deal of excellent research on the part of Messrs. Ilford Limited, led to the fine prints which Dufay-Chromex are now making, and by the courtesy of the Company you will now see a representative print of Louis Dufay's process as it stands to-day.

Turning from additive to subtractive pictures, the early results of Hamburger, Cinecolor and a multitude of other two-and three-colour processes, some of them still very much alive, have yielded pride of place to Technicolor, which is actually a complete vindication of dye imbibition and dye transfer combined with the fourth "key-print" in black and white, which has meant so much to photo-mechanical reproduction. Messrs. Technicolor Limited have kindly allowed me to show a short print which now follows.

One cine process of outstanding interest is that of Dr. Bela Gaspar, who has used film coated with three emulsions containing dyes which are selectively bleached out in processing. A yellow and a pink emulsion are coated one side of the base, and a blue emulsion the other side. By a most ingenious printer the images from three separation positives are printed simultaneously. Here again time forbids more than giving a brief reference to a very beautiful piece of work. The diagram in the upper which shows the essence of the printing process, is taken from Major Klein's book, *Colour Cinematography*.

I think it is an open secret to certainly was in America when Technicolor printing methods were applied to Kodachrome film negatives, and that here the Kodachrome film negative, with its excellent colour rendering, may be used as a medium for making separation negatives for imbibition prints.

The story of the colour print on paper is almost as long as that of the transparency, except that it made its appearance in connection with the

early additive processes. A good deal of time was probably wasted in attempts to make two-colour prints, which at best can do little more than resemble the original colours.

Long years were devoted to dye mordanting, toning with metallic salts, and to the early imbibition processes. Diachrome was the earliest mordanting process, invented by Dr. Traube, who fourteen years later introduced the improved Evachrome, which is still in vogue. The silver images are so mordanted that suitable dyes will attach themselves in more or less strict proportion to the various tones or densities. Then came, too, the elaboration of the original imbibition or hydrotype process, and still later, of course, the method of dye transfer from relief matrices, though here it should be mentioned that Sanger Shepherd had done some good work in transferring dyes from his gelatin reliefs on celluloid on to a single paper support in the early years of this century.

To what extent the early method of making prints by building up three images toned with metallic salts has stood the test of time is seen in the Defender Chromatone process, which I imagine many of those present have tried out. In this process advantage has been taken of the nickel-dime, thyl-glyoxime magenta tone, which still seems to be the only really satisfactory minus green. It was the magenta image which was the stumbling block to the tuning processes for a quarter of a century.

There have, of course, been intermediate hybrid prints, notably *Defender Chromatone*, *Imbichrome*, *Imbichrome*, and *Imbichrome*, and an intermediate system has been treated with selective bleaching of the dye to give a magenta colour. This was used for the same time as the *Imbichrome* process, but it was not long before it was dropped for being off the mark.

The first real dye process, and the first to be used for the production of colour prints, was the *Imbichrome* process, which was developed by Dr. Traube. It was a two-colour process, and the images were printed on a single sheet of paper. The process was very simple, and the results were very good. It was the first time that a colour print had been made on a single sheet of paper.

The *Imbichrome* process was a two-colour process, and the images were printed on a single sheet of paper. The process was very simple, and the results were very good. It was the first time that a colour print had been made on a single sheet of paper.

paper called "Uto," which was a black looking mixture of three primary coloured dyes that were specially sensitised so as to bleach out very readily. A piece of "Uto" paper printed under an Autochrome gave a pretty good reproduction of the original colours, and by fixing with an organic stabiliser the prints were more or less permanent. I assisted Dr. Smith to give an exhibition of his work at the First Avenue Hotel, and later the experiment was attempted of taking Autochrome portraits at the *Daily Mirror* studio in the Strand, at that time, and printing them on "Uto" paper by arc light. The absence of sufficient sunlight in England, and the inadequacy of the arc light soon proved the idea to be impractical, and it was dropped.

An important change in the outlook of colour photography took place when the function of exposed silver bromide to give rise in development in the presence of certain colour formers to dye substances was but needed to the problem. The processes we have so far considered depend on the coloured images obtained by addition of subtractive methods from black and white images, or from relief gelatins which are dyed in which control a pigment. The processes of imbibition depend on the formation of appropriate dye stuffs by the action of the by products of development on colour formers.

These two and Alfred Watkins had noted the deposition, in situ of the coloured dyes, when developing with pyro and iron, and *Imbichrome* made and the early stages of developing with hydroquinone and iron. The *Imbichrome* process, published in 1900, was the first to use a single sheet of paper for the printing of three images. The process was very simple, and the results were very good. It was the first time that a colour print had been made on a single sheet of paper.

The *Imbichrome* process was a two-colour process, and the images were printed on a single sheet of paper. The process was very simple, and the results were very good. It was the first time that a colour print had been made on a single sheet of paper.

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Works." It showed the various processes which ensue upon the dispatch of a telegram at the Post Office until it is delivered to the recipient, and the device of colour was used to indicate the mechanical and electromagnetic operations. The other was an I.C.I. film, entitled "This is Colour," the photographic work being by Jack Cardiff. It represented work on dyes from the stage of investigation with the few cubic centimetres in the test tube, to the final pouring of gallons in the vats. The final shots were a vivid succession, showing the innumerable ways in which colour enters into modern life, and made what the journalist would call a perfect riot—or more properly, a dance, for it was so harmonious—of colour.

At the end of the lecture and the projections, discussion was called for, but none was forthcoming, and the chairman (Mr. TRITTON) proposed a vote of thanks to Mr. Thorne Baker. He said that Mr. Baker had been actively engaged in work on colour sensitive emulsions for many years, and had had a good deal to do with the results of colour applied to cinematography. He had given a masterly review of these developments, and had drawn from his vast experience of the way in which the whole process had been brought to its present stage of excellence. The lecture would be even more valuable when it was seen in print, and would form a review of the subject to which constant reference would be made.

The vote of thanks was accorded by acclamation.

Mr. THORNE BAKER thanked those present for listening to him, and repeated his apology that in a short paper it was impossible to do more than give a few incidental glimpses into what had gone on. The day would come when they would have a series of lectures on colour photography, and he thought it would run into quite a long course, because colour photography was now branching out into so many different fields that one could do no more than hope to be a specialist in one of them. In dye chemistry, the subject of the second film which was shown, the whole problem was of great importance to industry. In the years to come it would be possible for a lecturer to dissect these matters much more ably than he had been able to do that afternoon.

CORRESPONDENCE

The Editor,

The Photographic Journal.

THE RADIOGRAPHY OF MINIATURE MASSES

Sir,

In the first sentence of your article on page 357 of the September issue of *The Photographic Journal*, you refer to what is presumably the above technique, by the term "Mass Miniature Radiography," and in the last sentence of the same article to "Miniature Mass Radiography."

Your uncertainty as to which is the best description of this new and increasingly important technique is shared by many, and it may be desirable to draw attention to the fact that a representative meeting of the manufacturers and users of the equipment and materials used in this technique was called by B.S.I. with a view to introducing standardisation at the earliest possible moment. As was perhaps to be expected from such a representative gathering, unanimous agreement on no aspect of standardisation was achieved at its first two meetings, but—with only one dissentient—it was recommended that the term "Fluorography" should be adopted as a description of the process. Surgeon-Captain W. C. Brooks, in proposing that this term be officially recognised, pointed out that it was the name given to the method by the man who first introduced it some years ago in Brazil; it was the term in use throughout America; and was more logical than the clumsier title "Mass Miniature Radiography." Among criticisms of the more cumbersome term which were put forward at the meeting were:—

- (1) The technique of photographing the fluorescent screen will not necessarily always be applied on a mass scale;
- (2) One does not necessarily have to photograph the fluorescent screen on so-called "Miniature," i.e., 35 mm. film. In America, for example, 5×4-in. size is more popular;
- (3) The resulting film is not a radiograph, which by definition must be caused by X-rays, but a photograph of a fluorescent image.

It therefore seems that the term "Fluorography" (besides falling into line with other accepted terms such as "Fluoroscopy"—the visual examination of the fluorescent image) would not only be more convenient and descriptive but more nearly correct. There would, of course, be no reason why, to distinguish between different types of "Fluorography," one should not refer to "35 mm. Fluorography," "5×4-in. Fluorography," etc. Failing "Fluorography," the Committee agreed that a reasonable alternative name would be "Photo-Radiography." It is perhaps unfortunate that the one dissentient was representing the Ministry of Health, and his only argument for retaining the more clumsy and illogical term was that the public were already becoming accustomed to it and would not understand such terms as "Fluorography" or "Photo-Radiography." If this is a valid argument, we ought still to be calling

photographs "sun pictures taken from life" or "photogenic drawings."

It would seem desirable that *The Photographic Journal* should support the lead given by the official standardising body in this country.

I am, etc.,

(Signed) D. A. SPENCER.

15, Broomfield Court,
Gooseacre Lane,
Kenton, Middlesex.
18th October, 1943.

The Editor,
The Photographic Journal.
Sir,

The Hartree Effect

The phenomenon of intensification of the latent image by subsequent exposure to weak light was discovered by the late W. Hartree while working at Cambridge in the Department of Physiology. A note describing the effect by W. Hartree and A. V. Hill appeared in the *Journal of Scientific Instruments*, in October, 1932.

We have a precedent for associating photographic effects with the names of their first discoverers, e.g., "Herschel effect," "Eberhard effect," "Becquerel effect." It would be in accord with justice and tradition to call the phenomenon in question "the Hartree effect." This would certainly be better than the unpleasant term "latensification" which is sometimes used.

I am, etc.,

(Signed) W. H. DIMSDALE,
Director.

Ilford, Limited,
Ilford, London.
23rd October, 1943.

P. S. PROCEEDINGS COUNCIL MEETING

MEETING of the Council of The Royal Photographic Society was held at 16, Prince's Gate, on November 8th, 1943, the following were present: President, Mr. D. McMaster, chair; Messrs. H. Baines, H. Bushe, J. H. Coote, A. E. P. W. Harris, G. E. W. T. Midgley Illingworth, H. Johnston, H. Bedford, Mrs. Rosalind Maingot, F. J. Mortimer, J. H. Ronald Procter, S. Schofield, H. B. Scott, W. Symon, Tritton and Hugo van Oyen.

Members

The following Candidates were put forward for Membership:—

H. E., 71, Old Street, Ludlow, Shropshire.

Ralph, Amistad, Abbey, Rhos-on-Sea. (Member, City of Food Photographic Society).

John Edward, Stones Croft, Dale Rd., Todmorden, Lancs.
Arthur Leslie, 248, Peverell Road, Peverell, Plymouth.
John Leslie, 12, Coventry, Pirton Lane, Churchdown,

Frederick George Leslie, Greenfield Avenue, Carpenders, Watford, Herts.

Arthur Claude, 114, Ladock Road, Solihull, Warwick (Member, The Solihull Photographic Society).

Thomas, 24, Narbonne Ave, London, S.W.4.

Leonard William, c/o 16, e's Gate, S.W.7.

Cyril Christopher, 36, Grays Park Road, Quinton, Birmingham, 32. (Member, Aston Photographic Society).

Mr. Bernard John, Heather, George, South Africa.

Edward, 20, West Parade, Richmond, Norfolk. (Member, Richmond and District Photographic Society).

Cedric William, 9, Balmoral Ave, Bedford. (Member, Bedford Camera Club).

Thomas James Hart, 5, Ely, Sea Mills Park, Westbury, Bristol.

Denis James Bryan, 14, Avonville Road, Catford, S.E.6. (Member, South Suburban and District Photographic Society).

Cooper, Septimus James, 17, Sandilands Road, Broadway East, Northampton. (Member, Northampton Natural History Society, Photographic Section).

Cullen, George Paterson, 5, Laurie Terrace, Leven, Fife.

Cox, Bernard Hugh, F.S.I., L.R.I.B.A., 1, Willow Road, Hampstead, N.W.3. (Hon. Member, Nottingham and Notts Photographic Society).

Dickinson, Harold Owen, 55, King's Avenue, Woodford Green, Essex.

Doja, Mohammad Qamrud, Science College, Patna, India.

Dunn, Sydney, 33, Parkview Court, Fulham High Street, S.W.6. (Member, Putney Camera Club).

Duthrie, H. E., (Sub-Lt. R.N.Z.N. V.R.), 34, Bracken Gardens, Barnes, S.W.13.

Ellwood, Leslie Ashcroft, F.R.G.S., Highlands, Warwick's Bench, Guildford, Surrey.

Fisher, Robert Chapman, 368b, Alexandra Avenue, Harrow.

Freer, Charles Edward, Bembridge, 10, Sybil Road, Leicester.

Ganderson, Herbert John, 727b, Green Lanes, Winchmore Hill, N.21.

Harrison, Clifford Gaitskell, 24, Hartington Crescent, Coventry.

Harrison, Thomas Stanley, Manor House, Tittensor, Staffs.

Head, Henry Francis William, 8, Cromwell Avenue, Aylesbury, Bucks.

Hebden, George E., 78, Gloucester Avenue, Lancaster. (Member, Lancaster Photographic Society).

Hood, Oliver, 135, High Street, Blackwood, Monmouth.

Keable, Herbert George, 7, Orchard Road, Andover, Hants. (Member, Photographic Miniature Postal Portfolio).

King, Alfred, Melfort, Kensington Road, Belfast.

Koper, Jack, 29, Christchurch Hill, Hampstead, N.W.3. (Member, Capetown Photographic Society).

Meister, Frank, 3840, Olive Street, Kansas City, Missouri, U.S.A.

Moreman, Kenneth George, 146, St. Andrews Road, Montpelier, Bristol 6.

Orchard, Mrs. Mary, 2, Mylor Road, Ecclesall, Sheffield 11, Yorks.

Rothwell, Charles Maurice, 21, Windsor Road, Clayton Bridge, Manchester, 10. (Member, United Stereoscopic Society; Manchester Amateur Photographic Society).

Saunders, Norman Frank Tilbury, B.Sc., M.I.E.E., 86, Evelyn Avenue, Ruislip, Middlesex.

Stephenson, Ruth Carter (Miss), A.I.B.P., 3, Church Row, Chislehurst, Kent.

Steyn, Samuel David, 34, Market Place, London, N.W.11.

Sturton-Davies, Charles Horace, Catfoss, near Hull, E. Yorks.

JUNIOR MEMBERSHIP

Bouchier, Eric Ronald, c/o 9, Barleycroft Road, Welwyn Garden City, Herts.

Cookson, Gerald Hugh, Nether Warden, Hexham, Northumberland.

Cookson, Richard Clive, Nether Warden, Hexham, Northumberland.

Finbow, George Frederick, "The Haven," Hildale Road, Cheam, Surrey.

Holden, Alan Vernon, 30, Mansion House Road, Paisley.

Elections

The Candidates nominated at the meeting of the Council held on October 11th (see p. 395, November issue, this *Journal*), were elected to Membership.

Obituary

The Council greatly regretted to learn of the death of the following Members:—

F. C. Boyes, of London (Fellow). (Honorary Solicitor).

August Knapp, of Western Australia. (Fellow).

F. W. Ricks, of Nottingham. (Member).

Conferment of the Honorary Fellowship

The Honorary Fellowship of the Society was conferred by the Council on Mr. Joseph M. Bing (Fellow) on the motion of the President, Mr. D. McMaster (Fellow), seconded by Mr. J. Dudley Johnston (Hon. Fellow), in recognition and appreciation of his distinguished services to Photography and to the Society, extending over many years.

Honorary Solicitor

Mr. Norman Boyes (Associate) was appointed Honorary Solicitor to the Society in succession to his father, the late Mr. F. C. Boyes, on the proposition of Mr. Thomas H. B. Scott (Hon. Fellow), seconded by Colonel W. Symon (Associate).

Henderson Award

Upon the recommendation of the Scientific and Technical Group Committee the Council decided to reinstate the award of a medal to those

receiving grants from the Henderson Award funds. Three candidates, Dr. J. D. Kendall, Dr. G. W. W. Stevens and Dr. E. P. Davey, were recommended and approved to share the balance of the accumulated income of the fund after defraying the cost of the medals. This involves delaying the distribution until conditions permit medals to be obtained, and the recipients were informed accordingly.

F. F. Renwick Memorial

The Council approved the recommendation of the Scientific and Technical Group Committee that a memorial perpetuating Mr. Renwick's memory and his contributions to photographic science be instituted and appointed a Committee to consider and report on the form which this should take.

Admissions to the Fellowship and Associateship

The Council considered twenty-four applications from Associates for admission to the Fellowship, the following were admitted :-

Basil Frederick Thomas Bailey (London).
John Samuel Barlee (Chester).
Arthur David Bensusan (Johannesburgh).
John Cardiff (Slough).
Howard Chandler Colton (Rochester, U.S.A.).
James Leonard Houghton (London).
Leslie Frederick Thompson (Sutton).
Alfred William Watkins (Gerrards Cross).
Frederic Weston (Sevenoaks).
The Council further considered ninety-five applications from Members for admission to the Associateship, the following were admitted :-
Owen Victor Morley Alexander (Banbury).
Lionel E. Austin (London).
John Edward Prince Bardsley (London).
Harold Austin Bassett-Lowke (Northampton).
Treeby Bolton (Kewick).
Leopold Brossloff Bourne (London).
George William Avery Colebrook (Stapleford).
William N. Crosby (Neasham).
Eric David Dickson (Woking).
Frank Sellar Dbble (Crosby).
Robert Stephens Duncan (Belfast).
Charles Graham Eddy (Manhasset).
John Fairweather (London).
John H. Flux (Littleover).
Harry Stacey French (London).
Edward Arthur Goldring (St. Albans).
Shiva Gopal (Lucknow).
Lloyd Middleton Hampson (East Kilbride).
Stuart Conan Hayward (London).

Cyril Henry Hobbs (Reading).
Thomas Hollingsworth (Beverley).
James Barlow Hurst (Darlington).
Edgar Hymian (London).
Eugene Kibbe (Alberta).
James Lamonby (Bishopston).
Otto M. Lilien (Jerusalem).
John Platt Little (Wakefield).
Clarence Leslie Manlove (London).
Leonard McCombe (London).
Lotte Meitner-Graf (Mrs.) (London).
Frank Micklethwaite (Aberporth).
Cyril Douglas Milner (Birkdale).
Vernon Paton Milner (London).
George Robert Mott (West Bridgford).
Kenneth George Alfred Pankhurst (London).
Stuyvesant Peabody (Chicago).
Bernard Jack Rastall (London).
Anthony Gordon Rigo de' Righi (London).
Cyril Wilfred Roberts (High Wycombe).
Harry Charles Victor Rout (London).
Ian Norman Schiller (London).
Arthur Schonfeld (Prestwich).
Lindley Searle (Cowley).
James Leonard Shaw (London).
Charles Frederic Simcock (Burnley).
Robert Charles Morris Smith (London).
Rupert Peyton Smith (Grenoside).
William Ferguson Sommerville (Rutherglen).
Henry James Southern (Handsworth).
Gottfried Spiegler (London).
John Stephens-Orr (Glasgow).
E. Johnson Taylor (Saxlingham).
Eric Fred Teal (London).
Philip William Thompson (Coventry).
Thomas Thorburn (Nottingham).
Gordon Moffitt Tranter (Calgary).
Francis Henry Viner (Castle Bromwich).
Montagu Watson (London).
Albert William Wood (London).
Edward Ford Woollard (Ashford).
Maurice Philip Wooller (Haslemere).

Gifts

The Council accepted the following gifts with much appreciation: Two books from Mr. L. Keith Clayton (Member); a copy of "Masterpieces of Italian Art," 1868, from Mr. R. C. Leighton Herdson (Associate); a collection of fourteen books from Mr. P. W. Thomas (Member), for the Library; a collection of early photographs from Miss Robinson; two Collodion Positives from the Rev. T. Gear Willett, for the Museum; ten Prints by and from Mr. M. O. Dell (Fellow), for the Permanent Collection.

Election of Council

With the November issue of the *Journal* members will have received forms for the nomination of Officers

and Members of the next Council. To be valid these must reach the Secretary before the 1st of January next.

Rebates

Secretaries of the Federations, etc., in the Photographic Alliance are requested to make a special note that all claims for the half-crown rebate made annually in respect of members of the R.P.S. who are also members of an affiliated Society must be received by the Secretary of the R.P.S. before the 1st October in each year, and that no claims received after this date will be allowed.

Another Jubilee

This month the Kingston Camera Club completes an existence of 50 years, and to mark the occasion its Founder and President, Dr. W. E. St. Lawrence Finny, M.D., F.S.A., J.P., has presented the Club with a silver trophy, to be known as the Jubilee Challenge Cup. A perpetual trophy, it is to be awarded to the best picture entered in a special exhibition held publicly and annually in May. Each year a well-known photographer will be invited to act as judge.

Mr. V. Banks, the Hon. Secretary of 1, Cadogan Road, Surbiton, Surrey, will be pleased to give all particulars about membership and the competitions.

Captain Harry Rignold

It is with deep regret that we have learnt of the death of Captain Harry Rignold, M.C., who will be known to many members of the Society for his work with the Crown Film Unit. He was one of the first cameramen to be appointed to the Army Film Unit, and he served with the B.E.F. in France in the early days of the war. He accompanied the Commandos on the famous Vaagso raid, where he secured a film that is still considered to be the best single man coverage of the whole war. He later joined the Eighth Army and went with them through North Africa to Tunis. He was present at the landings on the Salerno beaches, and it was in action here that he was killed.

Shortly before his death he was awarded the Military Cross in recognition of gallant and distinguished services in North Africa.

House Exhibitions

The Exhibition of Colour Prints announced for December is unavoidably postponed. Instead, part of Mr. Keighley's collection will remain on show. The remainder, consisting of sixty pictures, is transferred to the Camera Club, 11, Grosvenor Street, W.1, for this month.

MEMS OF INTEREST OM VARIOUS QUARTERS

I. Bedford Lemere (Hon. Fellow)

f the real personalities in
bography it has been my
to meet is Mr. H. Bedford
Honorary F.R.P.S., who
r celebrates his Diamond
is a member of The Royal
phic Society. He tells me
ined it in 1883, when he was
teen years of age. I am cer-
all photographers, and par-
those members of The Royal
phic Society, will unite in
ating Mr. Lemere on this



edford Lemere, Hon. F.R.P.S.

by J. C. A. Redhead, F.R.P.S.

1. Many years ago the
ecorded its appreciation of
as a distinguished archi-
tographer by the award
orary Fellowship.
mere joined in 1881 the
which was founded by his
out 1863, and which has
ied on uninterruptedly at
ad, W.C.I., since 1865. It
interesting to know how
tographers first had their
the art awakened by the
amples of architectural
hy exhibited in the show-
17. There must hardly be a
of distinction in London
not been photographed by
re, and his collection of
comprising over 30,000, is
a treasury of architectural
London of the past and

Mr. Lemere confesses to a prefer-
ence for the London of the 80's and
90's; it had a charm and gaiety of
its own in those days and, in his
opinion, a more friendly atmosphere.

He was a youth of 18 when he
joined The Royal Photographic Soci-
ety, and still remembers the look of
surprise on the faces of the Members
when he attended the meetings at the
Gallery of the "Old" Water Colour
Society, at 5a, Pall Mall East, which
was demolished a few years ago. He
was much the youngest of those
present, and confesses that he re-
ceived a great amount of help and
kindness from them. He recalls the
late Mr. Sebastian Davis, a great
advocate of pyro ammonia developer
and his description of pyro and am-
monia as going together as happily as
roast beef and Yorkshire pudding.

Mr. Lemere was President of the
Professional Photographers' Associ-
ation in 1930, and has worked strenu-
ously on behalf of the Association
and later The Institute of British
Photographers. He has travelled
extensively all over the country on its
behalf, and there is no doubt that the
present position of the Institute owes
much to the hard spade work which
he and other colleagues put in on its
behalf when it was known as the
Professional Photographers' Associ-
ation. There must be few professional
photographers in any part of the
United Kingdom who have never
made the acquaintance of "Pa"
Lemere.

Members will remember the dis-
tinguished exhibitions of his work
which were shown at Russell Square
and Prince's Gate and which at-
tracted so much interest and atten-
tion. His work as an architectural
photographer has a distinction all its
own and has rarely been surpassed.
The genial personality of "Pa"
Lemere has endeared him to his col-
leagues everywhere, and his good
humour and stock of jokes, which
never fail, are a constant source of
pleasure and encouragement to his
friends. No mention of him would be
complete without reference to his
association with the Rotary Club of
London, of which he has been one of
the most popular members for many
years.

D. MACMASTER.

Mr. Keighley's Diamond Jubilee

We referred in our July and
August issues to the celebration by
Mr. Alexander Keighley, Hon.

F.R.P.S., this year of his diamond
jubilee as a photographer.

A representative selection of the
pictures is being published by the
Pictorial Group of the Society,
with a critical appreciation of Mr.
Keighley's career and achievements,
by Mr. F. J. Mortimer, C.B.E.,
Hon. F.R.P.S., and a biographical
sketch by Dr. J. L. Hankey.

We shall hope shortly to make a
further announcement regarding this
publication.

Mr. J. Dudley Johnston writes: -
During November an Exhibition
in the Society's house commemor-
ated an event that was surely unique
in the annals of Photography. I
know of no other photographer of
the front rank than Alex. Keighley
whose active career has extended to
sixty years. Others have lived as
long and even longer but their
productive years have seldom ex-
tended beyond the age of three score
and ten. The nearest parallels that
come to mind are that other grand
old Yorkshireman, Frank Sutcliffe,
who died in 1941 at the age of
eighty-eight and Frederick H. Evans
who died a few months ago in his
ninety-first year, but in both cases
they had ceased to exhibit publicly
for at least a quarter of a century,
whereas Keighley now in his eighty-
third year has never missed a year
at The Royal and The Salon.

As already recorded in this *Journal*,
Keighley's Diamond Jubilee as a
photographer was celebrated in July
by a regular festival of his fellow-
countrymen and an exhibition at
the Bradford Art Gallery of a col-
lection of his work containing all
the most noteworthy of his pictures
produced between 1899 and the
present year. This exhibition was
transferred to London complete and
shown under the auspices of the
Society for the benefit of a wider
and more cosmopolitan public. By
doing so the Society not only did
honour to our leading British photo-
grapher but to itself and most
fittingly the Pictorial Group are
crowning the achievement by pro-
ducing a commemorative volume
containing reproductions of forty-
eight of the principal pictures to-
gether with a biographical sketch by
Dr. J. L. Hankey and an apprecia-
tion of Keighley's artistic position
by F. J. Mortimer whose qualifica-
tion for the task is self-evident. In
war-time both these undertakings
represent no mean effort, in which
we may take legitimate pride.

Mortimer justly draws attention
to the fact that Keighley having
in the closing years of last century
settled down to a method of ex-

pressing himself suited to his outlook, never afterwards deviated from it. The subject matter varied but the technique did not alter. He had evolved his individual "manner" and experimentation was ruled out. Dr. Hankey describes the stages that intervened between the original small negatives and the finished 20 x 16 pictures. These are invariably carbon prints in a warm black colour which sometimes tends towards brown. On the gallery walls their uniformity of size and colour and general weight of tone made for an impressive unity with very happy results. It may be said with safety that no other of our major photographers could have achieved this in anything like the same measure. It is little short of marvellous that it did not result in a sensation of monotony but subject matter and composition are so cunningly varied that no hint of that was experienced.

The outstanding characteristics of his work are his wonderful eye for a subject, his unfailing instinct for composition and balance and his poetical romanticism. No other photographer has ever combined all three so perfectly. The features that impress themselves on viewing these works are foremostly that these are indeed pictures and secondly that their subjective basis is essentially poetic. With their photographic technique we may not unreasonably disagree if we incline to modern views on the functions of photography. Examined in detail the definition may lack the precision that the moderns deem essential, textures may be lacking, skies may not always conform to naturalistic truth but viewed as a whole these details are seen to fuse into a unity that is far more stimulating than accurate focussing and the depth of the field of the miniature camera could possibly effect. The justly related tone values, the atmospheric depth and the genuine planal separation in these pictures are far more vital elements than the most correct modern technique would give and to this is added his mastery in the selection of subject and that "vision" that is the artist's rarest gift. One point, a minor one perhaps but of great importance, must strike all who have examined Keighley's pictures and that is the almost uncanny way in which he gets his figures, be they humans or animals, into the exact place and grouping that artistic necessity demands. Whether it is good fortune or patience or an unexplained gift I do not know, but the results show how surely and

swiftly he seized the exact combination when it occurred.

The exhibition was indeed a great occasion. One hundred and thirty-one pictures were shown, twenty-four of them in the original frames that were customary forty years ago.

Film Salvage Appeal

Readers will be interested to know that the appeal made by Guy's Hospital for discarded film has received an excellent response. The hospital authorities wish to thank all who have forwarded their unwanted films. They have sent an acknowledgment in all cases when the names and addresses of senders were given, but they received many anonymous parcels.

Through the Midland Bank, Ltd., the hospital has received the astonishing total of 250 million film records; these records actually represent 1,000 miles of discarded film. The B.B.C., too, periodically contributes large quantities of sound track. Many other organisations, amateur photographers and members of the medical profession have also contributed large quantities.

The following extract from an article, which appeared in the issue of the *Edinburgh Evening News*, dated September 13th, gives some interesting information concerning the importance of used film as a substitute for many materials:—

"This is what happens to old films. The celluloid is used as a substitute for nitro-cellulose in dopes and varnishes, thus releasing the genuine article for explosives.

"The dope produced from the dissolved celluloid is being used as a substitute for rubber, as a waterproofing material, and as a stiffener and adhesive. It is being used on gas capes and is replacing rubber in certain types of groundsheet.

"As 17,000,000 films are sold annually in this country in normal times, it is certain that there are tons of old negatives lying about. If you can't get them accepted here, Guy's Hospital, as you now know, will accept them gratefully on behalf of the Ministry of Supply."

Guy's Hospital has suffered severely from the war; no fewer than 135 bombs have fallen on the hospital, which covers 14 acres, the value of the buildings lost being £105,000. The value of its property destroyed outside the hospital is £333,056, representing an annual loss from rents of £20,000, or approximately one-third of its assured income.

Communications regarding film salvage should be addressed to the Appeal Secretary, Guy's Hospital, London, S.E.1.

Wide Aperture Lenses for Indirect Radiography

Messrs. Taylor, Taylor and Hobson contribute the following interesting information:—

Tuberculosis, one of the most deadly diseases has been for many years and still is one of the major problems of the medical profession.

An early diagnosis is of paramount importance if the progress of the disease is to be arrested. Often, it is not until the disease has reached an intermediate or advanced stage when medical advice is sought, and when the disease has passed beyond the early stages its further progress can be arrested only with difficulty and medical treatment over a long period.

During the last 25 years X-Rays have been used to assist in the diagnosis of pulmonary tuberculosis, commencing with the original method of making a direct X-Ray of the chest on large-size film. Although this is perhaps still the most satisfactory method, it is considered too expensive for the mass examination of the whole population, and it is only by a systematic examination of the masses that the disease can be stamped out.

It is now hoped to attain the early diagnosis of large numbers of people in rapid succession at a moderate cost by Mass Miniature Radiography. This method makes use of a camera and lens which the natural sized X-Ray image on a fluorescent screen is reduced in scale by the lens and an image reproduced on photographic film.

The two principal types of apparatus are:—

- (a) Using 5in. x 4in. individual film.
- (b) Using 35 mm. cinematograph film.

The ordinary popular type of photographic lens is not suitable for this X-Ray screen photography on account of the very low intensity of light radiated by the fluorescent screen. It has therefore been necessary to develop new types of lenses for this work, and in this particular field the development of Optics by Messrs. Taylor, Taylor and Hobson, Ltd., has brought valuable aid to medicine.

In 1935 a request came for a lens of this class from South Africa, and Messrs. Taylor, Taylor and Hobson, Ltd., developed a lens of 2½ins. focal length with an aperture of F/1. This first effort had certain shortcomings, namely, field curvature, not to be unexpected with a lens of such wide aperture and a variation between the photographic and visual foci. Nevertheless, this development represented a noteworthy advance in lens design and manufacture. Since that time, however, great developments have

ade by X-Ray engineers, uphic emulsion chemists and kers. and the quality of the has made possible radio-records of the Masses at a le cost; the quality of these leaving little to be desired.

£2 came a request from the ational Memorial Association s to work at a reduction of 6 , and to reproduce the image in. $\times 16$ in. fluorescent screen $\times 2\frac{1}{2}$ in. on a 5 in. $\times 4$ in. film. focus "Taylor-Hobson" lens duced having an aperture of nd this lens was ultimately type "A" apparatus referred e, and which was manu- in the U.S.A.

er requests came for lenses te on type "B" apparatus, use of 35 mm. panchromatic ; sensitivity peak of which ; with the spectral emission evy-West yellow-green fluor-reen. The image had to be ed lin. square on standard film from the usual 16 in. \times reen. This problem was of nal interest to the Mathe-

Research Department of Taylor, Taylor and Hobson, it had been stated that hith- only suitable lens for the pur- s the 50 mm. F/1.5 Zeiss

This claim was effectively d by the production of the

Taylor-Hobson 2 in. F/1.5 lens, which was fitted to the first demonstration unit of the Medical Research Council. This was reported to give better results than the Zeiss or any other lens previously used.

Lenses of this type have a very high resolving power with a flat field, and their chromatic aberrations are so adjusted that the visual and photo-graphic focus are identical on the spectral range used in radiographic work.

In special circumstances where it is necessary to reduce the electrical capacity of a radiographic unit to facilitate mobility, a lens of large aperture, F/1.0, with a focus of 2 $\frac{1}{2}$ in. is used. The definition obtained with this lens is somewhat less critical than that of the F/1.5 and there is some field curvature, but it will be understood that this is a compromise to obtain the maximum light-passing power.

A further important and essential feature of these Taylor-Hobson radio-graphic lenses is that they all have their air to glass surfaces "bloomed" This process is the deposition, by evaporation, on the air glass surfaces of a film of correct thickness of lithium, magnesium, or calcium fluoride in order to suppress surface reflections. Such reflections, occurring at each air to glass surface, reduce the contrast of the image which

in the case of radiographic records is of a comparatively low standard under the best circumstances. These reflections in a lens which has been treated by this process are reduced to about 5% of their normal value, and lenses having their surfaces so treated actually pass more light than an untreated lens, and truly do work at their stated apertures.

In some hospitals Contax cameras have been adapted to X-Ray units and it is interesting to note that the "Taylor-Hobson" 2 in. F/1.5 lens can be adapted to these cameras.

Optics have come to the aid of medicine in another direction during the last ten years through the provision of lenses, also produced by Messrs. Taylor, Taylor and Hobson, Ltd., for photographing the move-ment of limbs by cine radiography. These lenses are used with 16 mm. film, and the series include 1. $\frac{1}{2}$ in. and 1.6 in. focal lengths with the very wide aperture of F/0.83, in standard mounts, and a 2 in. F/0.8 in a focus- ing mount. The latter can be focussed between 3 ft. and 6 $\frac{1}{2}$ ft., and can be used in cameras which allow visual focussing. Adjustments have been made to the chromatic correc- tions to permit the lenses to be focussed visually. This is a valuable feature, as it dispenses with the nec- essity of focussing by making a series of settings of the camera.

ATTENDANCES OF OFFICERS, MEMBERS OF COUNCIL AND COMMITTEEMEN FROM DECEMBER 14th, 1942, TO NOVEMBER 8th, 1943, INCLUSIVE

NAME	Attendances at Council Meetings	Possible Attendances at Council Meetings	Attendances at Committee Meetings	Possible Attendances at Committee Meetings
Master, F.R.P.S. (<i>President</i>)	12	12	15	
A. Robins, F.R.P.S.	---	12	---	
rtimer, F.R.S.A., HON. F.R.P.S.,				
E. ...	12	12	17	17
s, D.S.C., F.R.P.S....	10	12	13	17
ttton, F.R.P.S. ...	12	12	15	15
awton, HON. F.R.P.S. (<i>Hon. Treasurer</i>)...	6	12	6	14
yes, F.R.P.S. (<i>Hon. Solicitor</i>)	---	10	---	---
ll, PH.D., HON. F.R.P.S. ...	7	12	3	3
ote, F.R.P.S. ...	9	12	4	5
mt, F.R.P.S. ...	8	12	4	4
. Harris, F.R.P.S. ...	10	12	9	10
. Herbert, F.R.P.S. ...	12	12	1	1
ey Illingworth ...	10	12	6	11
y Johnston, HON. F.R.P.S. ...	12	12	18	19
rd Lemere, HON. F.R.P.S. ...	7	8	---	---
alind Maingot, F.R.P.S....	7	8	1	1
xdge, F.R.P.S. ...	12	12	3	3
Procter, F.R.P.S. ...	7	8	2	2
Schofield, F.R.P.S. ...	11	12	3	3
n Wadenoyen, F.R.P.S. ...	4	8	---	---
eston, HON. F.R.P.S. ...	11	12	15	17
ilton, F.R.P.S. ...	9	12	3	5
Bushe, F.R.P.S. ...	7	8	2	2
H. B. Scott, HON. F.R.P.S. ...	10	12	12	16
on, A.P.R.S. ...	7	7	---	---

ANNOUNCEMENTS

SUBSCRIPTIONS

Members are reminded that the Annual Subscription for 1944 will become due on January 1st next.

The subscription for Fellows, Associates and Members is £2 2s. 0d.; Group subscriptions, which become due for renewal on the same day, are as follows: Scientific and Technical Group, 12s. 6d., (or without "Photographic Abstracts," 5s.); Pictorial Group, 5s.; Colour Group, 2s. 6d.; Miniature Camera Group, 5s.; Kinematograph Section, 5s.

Group subscriptions may be included with the Annual Subscriptions, and should be forwarded to the Secretary, The Royal Photographic Society, 16, Prince's Gate, London, S.W.7.

Arrangements have been made under which Members resident in the U.S.A. may pay their subscriptions to the Society to The National City Bank of New York, in New York, direct, or through their own Bank.

It is important to note that payment should be made

"For the credit of The Royal Photographic Society of Great Britain with the Midland Bank, Russell Square, London."

It will be appreciated if Members when taking advantage of this facility will advise the Secretary at the same time.

The nominal Annual Subscription in U.S. currency for Fellows, Associates and Members is ten dollars.

LECTURE PROGRAMME

Saturday, December 11th. 3 p.m. The Traill Taylor Memorial Lecture: "Sensitometric Apparatus for Controlling the Manufacture of Photographic Materials." By E. R. Davies, B.Sc., F.R.P.S.

Saturday, December 18th. 3 p.m. Joint Meeting of the Scientific and Technical Section with the Association for Scientific Photography. Conversation, Exhibition and Demonstration of photographic equipment used for scientific and industrial investigations.

Friday, January 7th. 6 p.m. Meeting of Pictorial Group. Lantern Evening. "My Favourite 100 Slides." By J. Dudley Johnston, Hon. F.R.P.S.

Saturday, January 8th. 3 p.m. Meeting of Colour Group. "The Director's Approach to Colour." Discussion between Darrell Catling and E. S. Tompkins, A.R.P.S., at the Gaumont British Theatre, Wardour Street.

Wednesday, January 12th. 6 p.m. Joint Meeting of the Kine Section with the B.K.S. "The Design of Sub-Standard Sound Projectors." At the Gaumont British Theatre, Wardour Street.

Saturday, January 15th. 3 p.m. Meeting arranged by the Miniature Camera Group. "Composition." By Ricardo.

Saturday, January 22nd. 3 p.m. Meeting of the Kine Section. "Some Aspects of Hollywood Film Production." By Lieut.-Col. Frank Capra, U.S.A.A.F. At the Royal Institution, Albemarle Street.

Saturday, January 29th. 2.30 p.m. Meeting arranged by the

Scientific and Technical Group. Symposium on Microdensitometry and Microsensitometry.

Friday, February 4th. 6 p.m. Informal Meeting of Pictorial Group. Miss Anne Jackson, F.R.P.S. "This Pictorial Photography—What is it?"

Saturday, February 5th. 3 p.m. Meeting arranged by the Pictorial Group. Frederick H. Evans (Memorial Lecture).

Tuesday, February 8th. 6 p.m. Meeting arranged by the Scientific and Technical Group. H. W. Lee, B.A., F. Inst. P. and Miss E. A. Neumann, Ph.D. "Surface Treatment of Lenses."

Saturday, February 12th. 3 p.m. "Photography's Part in the War: Fourth Year." By F. J. Mortimer, C.B.E., F.R.S.A., Hon. F.R.P.S.

Tuesday, February 15th. 6 p.m. "Problems Governing the Manufacture of the Precision Miniature Camera." By D. McMaster, F.R.P.S.

Saturday, February 19th. 3 p.m. Meeting arranged by the Kine Section. "The Work of the Film Division of the British Council." By Neville Kearney, Director, Film Division.

Saturday, February 26th. 3 p.m. The Presidential Address. By D. McMaster, F.R.P.S.

Friday, March 3rd. 6 p.m. Informal Meeting of Pictorial Group. George Halford, F.R.P.S., will give a talk on Gum-Bichromate Process.

Saturday, March 4th. 3 p.m. Meeting of Colour Group.

Tuesday, March 14th. Annual General Meeting. Members, Associates, Fellows.

Saturday, March 25th. 3 p.m. Miniature Camera Group Annual General Meeting and Criticism

JOINT MEETINGS

Birmingham Photographic Society, York House, Great Charles Street, Birmingham. Tuesday, December 14th, 6.30 p.m. "A Historical Review of Colour Photographic Processes." By F. J. Ingleton, F.R.P.S.

Bradford Photographic Society, The Science Room, Mechanics Institute, Bridge Street, Bradford. Saturday, February 12th, 1944 3 p.m. "Architectural and Record Photography." By J. Crowther Cox, F.R.P.S.

Bath Photographic Society, 13, Lower Borough Walls, Bath. Thursday, January 27th, 1944. "Camera Portraits and their Making." By Arnold Longman, F.R.P.S. Thursday, March 23rd. "Glimpses of the Alps." By Mrs. Emonet, A.R.P.S. This meeting will be held in the Pump Room.

Leeds Camera Club, Leeds Institute, Leeds. Monday, January 10th. "Lower Wensleydale, Past and Present." By H. Bryce Thomson, A.R.P.S.

Nottingham and Notts Photographic Society, Scouts' Hall, Shakespeare Street, Nottingham. Saturday, December 11th, 3 p.m. "Dalmatia, the Coast of a Thousand Islands." By Bernard B. Cox. (Lecture illustrated by Agfacolor Miniature Slides.)

Rotherham Photographic Society, The Crofts, Moorgate, Rotherham. Sunday, December 19th. "Against the Rules." A talk by H. T. Smith, A.R.C.A. Sunday, March 19th, 1944. "Approach to Natural History Photography." By Frank Newton.

EXHIBITIONS AT PRINCE'S GATE

December. (1) Photographic Alliance Competition Prints. (2) Prints by Alex. Keighley, Hon. F.R.P.S.

January, 1944. (1) Prints by Mrs. K. M. Parsons, F.R.P.S. (2) Prints by Douglas Croall. (3) Lantern Slides by E. R. Bull, F.R.P.S.

Feb. (1) Prints by Overseas Readers of *The Amateur Photographer*. (2) Prints by Foster Brigham, F.R.P.S.

March. (1) Prints by Members of the Miniature Camera Group. (2) Prints by Lieut. R. G. Fennah, F.R.P.S.

April. (1) Prints by Members of the Institute of British Photographers. (2) Prints by G. Scott Bushe, F.R.P.S.

THE YEAR'S PHOTOGRAPHY

PICTORIAL

NATURAL HISTORY —

RECORD

Royal Photographic Society Publication



STALLION

A. G. RIGO DE RIGHI

PLATE II



PALEO AMAYA

STUYVESANT PEABODY

PLATE III



FANTASY

MRS. ROSALIND MAINGOT, F.R.P.S.

PLATE IV



A CONVOY UNLOADS

J. C. HOLLOWAY, F.R.P.S.

PLATE V



THE ETERNAL SEA

F. J. MORTIMER, C.B.E., HON. F.R.P.S., F.R.S.A.

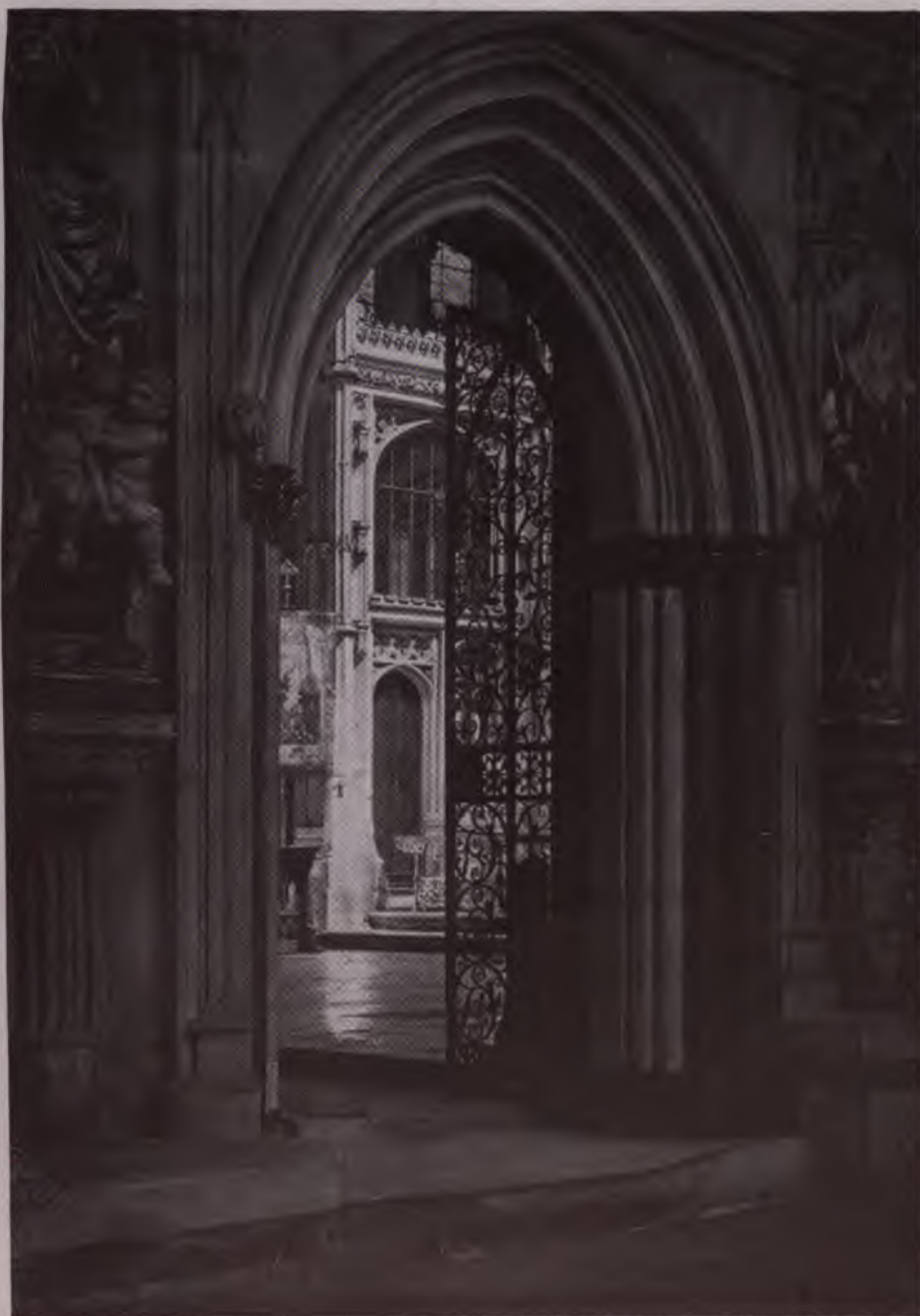
PLATE VI



THE LORD ABBOT

W. HAROLD HOUSE, F.R.P.S.

PLATE VII



SALISBURY CATHEDRAL

FRANK W. KNIGHT, A.R.P.S.

PLATE VIII



SUNSHINE AND SHOWER

MRS. DOROTHY D. WAGNER, A.R.P.S.

PLATE IX



MEMORIES

DR. JULIAN SMITH, F.R.P.S.

PLATE X



TOWER MILL, YORKSHIRE

DR. S. D. JOUHAR, F.R.P.S.

PLATE XI



UP FIELD

JEROME P. KRIMKE, A.R.P.S.

PLATE XII



SHETLAND SHEEP DOGS

MISS E. P. THOMPSON

PLATE XIII



WHEELS

MISS LAURA GRISWOLD

PLATE XIV



OLD SPICE

E. C. CROSSETT, F.R.P.S.

PLATE XV



JUDY

DR. S. B. COOPER

PLATE XVI



HOW'S THIS, MUMMY ?

JOHN PILKINGTON

PLATE XVII



THE SECRET

R. ERNEST SCOTT, A.R.P.S.

PLATE XVIII



NET MAKERS

ALEX. KEIGHLEY, HON. F.R.P.S.

PLATE XIX



DEEP VALLEY

F. W. FERGUSON, A.R.P.S.

PLATE XX



SHALL WE BE AMUSED?

W. G. BRIGGS, F.R.P.S.

PLATE XXI



DISCRETION OR VALOUR ?

E. HEIMANN, F.R.P.S.

PLATE XXII



HEART TROUBLE?

STUYVESANT PEABODY



BEDTIME FOR BETTY

G. SCOTT BUSHE, F.R.P.S.

PLATE XXIV



AFTER THE STORM

S. M. SWENSON, A.R.P.S.

PLATE XXV



SILENT WATERS

ANTHONY PEACOCK, F.R.P.S.

PLATE XXVI



"WHAT'S THAT?" H. DRYCE THOMSON, A.R.P.S.

PLATE XXVIII



STILL LIFE

H. J. HARPER ROBERTS, A.R.P.S.

PLATE XXVII



STILL LIFE

G. F. HARRIS, A.R.P.S.

PLATE XXIX



"RAJAH"

N. A. SCURRAH, A.R.P.S.

PLATE XXXII



MRS. ROSALIND
MAINGOT, F.R.P.S.



"HOW GREEN WAS MY VALLEY"

J. P. DELANEY

PLATE XXXIII



LANE

B. G. A. SNELSON, F.R.P.S.



NORMAN SETTING,
WINCHESTER

B. HUTCHINGS,
F.R.P.S.

PLATE XXXIV



FALLOW DEER BUCK

J. LOMAX, A.R.P.S.

PLATE XXXV



DAY-OLD GREY SEAL

T. O. RUTTLEDGE, A.R.P.S.

PLATE XXXVI



SEDION

MRS. K. M. PARSONS, F.R.P.S.

PLATE XXXVII



THE HIPPO FAMILY

R. G. FENNAH, F.R.P.S.

PLATE XXXVIII



BLACK-BACKED GULL

A. L. JONES

PLATE XXXIX



COOT

IAN M. THOMSON, F.R.P.S.

PLATE XI.



GREYHEN

G. B. KEAREY, F.R.P.S.

PLATE XLI



GRASSHOPPER $\times 6$.

VINCENT J. WATSON, A.R.P.S.

PLATE XLII



"THEY'VE ALL GOT A MATE BUT ME!"

OLIVER G. PIKE, F.R.P.S.

PLATE XLIII



PUPA OF ELEPHANT HAWK MOTII IN OPENED COCOON $\times 1$

S. BEAUFOY, F.R.P.S.



SHERBORNE, GLOS. MONUMENT BY WESTMACOTT SYDNEY PITCHER, F.R.P.S.



ELY—CHOIR WITH NAVE BEYOND

HERBERT FELTON, F.R.P.S.

PLATE XLVI



REQUIEM MASS FOR CARDINAL HINSLEY,
WESTMINSTER CATHEDRAL

THE TIMES

PLATE XLVII



DETAIL—CHOIR STALL FRONT, SOUTHWELL

H. M. SHEPPARD, A.R.P.S.

PLATE XLVIII



"JOURNEY'S END."
A London District Theatre Unit Production

G. SCOTT BUSHE,
F.R.P.S.

PLATE XLIX



INTERIOR, WEST DOOR, BEVERLEY MINSTER.
15th Century

H. E. ILLINGWORTH,
A.R.P.S.

PLATE I.



STEEL.

S. H. THORPE

PLATE LI



RUBBER RESEARCH

HAROLD WHITE, F.R.P.S.



LET'S GO, AMERICA

IRA A. SCHUR, A.R.P.S.

Pictorial Photography at The Royal Photographic Society's Exhibition

A Review by

F. J. MORTIMER, C.B.E., F.R.S.A., Hon. F.R.P.S.

AS each year of the war passes and events at home are seen in retrospect, the progress of photography stands out as one of the most remarkable of modern activities. Apart from the great part photography is playing as a vital essential in the war itself, restrictions and limitations brought about by war conditions have had little or no effect in quenching the desire for picture-making with the camera, particularly amongst amateurs, and the Exhibition clearly indicates the extent of this phase of photography at the present time.

There is little need to emphasise the general excellence of the show as a whole. An inspection will demonstrate this even to the most casual visitor. The quality of the exhibits, both pictorially and technically, is better than at any previous war-time exhibition, and compares more than favourably with any similar display organised by The Royal Photographic Society in peace time. If any complaint is to be made it is that, unfortunately, owing to the limitations of the wall space available the entire collection of selected prints in the Pictorial Section cannot be seen at one time. A still higher estimate of the show would undoubtedly be arrived at if this could be done, but again this year the prints exhibited in this Section are divided into two equal portions, the first half being shown during September and the second half during October. The total number hung this year is slightly in excess of that on previous occasions.

The First Half

To deal with the subjects that are in the majority, namely, the figure studies and portraits, "Montemartre," by John Nicol (7), is a typical example. This is an attractively presented figure, with perfection of technique in which the lettered title on the print serves a useful purpose in filling a blank space. Two figure subjects that border on the genre class and both extremely good in every way are "Bedtime for Betty," by G. Scott Bushe (13), and "Heart Trouble?" by Stuyvesant Peabody (22). Both these prints are worth careful study. The former is one of the most attractive in the show, both in subject matter and arrangement. The posing of the nurse and the little girl is perfect, while from the technical point of view it is without fault. "Heart Trouble?" is a more deliberate "set-up," with the figures plainly acting their parts and doing it extraordinarily well—both the sailor who is having his pulse felt and the pretty nurse at whom he is gazing. There is a touch of humour here that adds to the charm of the print.

"Whose Planes?" by Mrs. Dulce L. Rowan (2), is good technically and depends for its appeal on the strength of the pattern that is presented. The lines make a very effective design. A. Marrion's "Students" (16) is another well-posed arrangement. Mrs. Rosalind Maingot has two outstanding prints to her credit in the first half of the show, both very decorative. The first, "Crowning Glory" (67) is rather more vigorous in tonal contrasts and conflicting lines than most of this worker's pictures. Her "Fantasy" (72) is well up to her high standard in dealing with flesh tones in shadow. Here the nude figure is posed against a luminous background and every contour is balanced.

Among other figure studies that call for note in that they definitely illustrate the titles may be mentioned "The Cobbler," by W. A. Hooker (105), which although presumably a posed subject has an excellent suggestion of action. Another study that should not be missed is "The Critic," by Harold White (3). This is one of those photographs that suggests a fortunate snapshot, but was probably a carefully chosen and posed arrangement. In any case it tells its story adequately, and is an admirable print in many ways. John Ahern's "Railwaymen at Work" (5) is another in the same class that one assumes is a lucky snapshot seized on the moment, but one never knows.

"Let's Go, America," by I. A. Schur (1), is more "modern" in its outlook and has a topical bearing. The design is strong and vigorous, but needs a little study before the intention is grasped. "Flight," by C. T. Baker (37), is another example of this worker's high-speed work, of which we saw several examples last year. This is a fine specimen of instantaneous photography in which motion is well suggested and emphasised by the low viewpoint employed.

To pass to figure subjects presented on a somewhat larger scale with less reliance on the surroundings to make the picture, the Hon. M. W. Elphinstone's "Street Musician" (23) is a good example of photographic characterisation presented with impeccable attention to detail and technique. "The Rhythm Kids" (38) and "Military Melody" (40), both by L. Rosinger, each presents a group of three figures which have been very well managed and show an appreciation of rhythm and line that is emphasised by the instruments they are playing. They are both extremely good technical productions. "Rhapsody," by D. Kingsbury (68), should be noted as a beautiful rendering of a not too easy subject in which the violin player dominates the group, the members of which, however, usefully serve their purpose in giving the background support. "Pause for Applause," by Mrs. D. D. Wagner (54), is in the same class as the two prints by L. Rosinger referred to above. The good technical quality in the flesh rendering of the little darkies should be noted. Another print of L. Rosinger's that is worth comment is "The New Gadget" (55). The old bearded man with his presentation electric safety-razor is distinctly humorous.

Marcus Adams' two contributions to the first half of the show, "Boy's Head" (69) and "A Dream" (74), are typical prints by this worker. The former is rather lacking in luminosity in the darker portions, but the arrangement and spacing are admirable in both cases. "The Seamstress," by B. Garth (71), is a simply arranged subject, in which the presence of a needle and thread in the right hand would have been helpful; the pose and action indicate their presence. "Village Carpenter," by R. Moxley (80), is a notable piece of tone rendering and a fine character study from South Africa. The rich quality in the darkie's flesh tones is remarkably well done. "Best Wishes," by Lester Garner (85), is a well presented incident, complete with the right expression seen on many occasions but seldom portrayed so well. The print is perhaps a little on the harsh side. In the same class is "Black and White," by G. E. Gaisford (90). Here, although the tonal qualities are better, the cigarette is rather insistent, but possibly necessary to emphasise the title.

Axel Bahnsen, in his print, "Anguish" (92), shows a sound treatment of the two heads in making a notable composition. The flesh tones too are good throughout, but the texture of the printing process is a trifle too aggressive for a print of this size. Near by, G. Scott Bushe's two strong head studies, "Elliptique" (97) and "Lilith's Snare" (98), call for attention. Both have the fine technique one associates with this worker's productions, and both have a complete suggestion of balance. Another very beautiful print on the same wall that is worth careful study, both for its arrangement and technical charm, is "Sunshine and Showers," by Mrs. D. D. Wagner (103). Here the suggestion of rain is given admirably, and one does not ask if it is real or artificial, if the latter it is extremely well done and quite convincing.

"The Lord Abbot," by W. Harold House (106), is a fine example of Mr. House's more recent method of photographic procedure, in which biting detail is an outstanding characteristic. In this print, however, there are other good qualities, notably the lighting and expression, and the whole print is full of colour and luminosity. Mr. House's other print in this section, "The President of the R.P.S." (61), is not quite so happy. One does not associate Mr. McMaster's familiar appearance with the rugged skinned person portrayed here.

Dr. Julian Smith has two typical examples of his character studies. They are "Dry Humour" (118) and "Memories" (126). His fine photography shows no falling off in quality year by year. "Island Maid," by Jack Powell (112) gains in quality from the printing process employed. It is an attractive portrait, and the use of an "etching screen" is justified in this example.

There are not so many pictures in the show that come under the description of "Big Heads" which were so frequently seen in exhibitions a few years ago. This is all to the good, as portraits presented on a giant scale are seldom pleasing and frequently suggest monstrosities. A good example, however, and entirely successfully presented, is "Shall we be amused?" by W. G. Briggs (27). This is not only an attractive child portrait, presented with the worker's usual skill, but it has interest and point in the expression that has been so well caught.

Nearby, the two delightful head studies by Jack Powell, "Lady Fair" (29) and "Chela" (31), although not in the "big head" class, have qualities that make them very emphatic in spite of the delicacy of their presentation, which approximates that of red chalk drawings. They are subjects to

which this particular treatment is suited. "Taos Indian," by Max Joseph (45), is a strong character study, beautifully lighted and helped considerably by the decorative shadows of the background.

"April," by John Fairweather (49), is a "big head" and a striking presentation both in design and photographic technique, but one that does not call for too much investigation in regard to the pose, which is a trifle difficult to follow. A. Keith Dannatt's "Peasants" (78) has two big heads and is yet another example of this worker's apparently inexhaustible store of foreign peasant types. Here he has successfully overcome the difficulty in dealing with two heads of equal size and tonal weight. In "Owd Sheffield," by G. A. Walker (86), the skin textures are admirably lighted and perfectly rendered.

There are not many nude studies in the Exhibition this year. Mrs. Rosalind Maingot's "Fantasy" has already been referred to, and is probably one of the best. Shirley M. Hall's "Silver Point" (32) is a beautiful little picture, and is one of the most dainty nudes yet seen at this exhibition. The print will doubtless arouse considerable argument as to its method of production.

"Valeska," by A. Bahnsen (119), is decorative and of good tonal quality; "Figure Study," by S. D. Jouhar (122), is also decorative so far as the lines are concerned, but rather too heavy in tones; and "Coy," by H. E. Tyndale (123), is another nude with good flesh textures and commendably fine tones. "En Petite Tenue," by G. Newby (19), is a semi-nude and another version of the model that we have seen on previous occasions from this worker.

Child pictures are always popular, but there is not a great number in the show this year. "Young England," by J. H. Wilding (34), is attractive, largely on account of the child's personality, and "Thoughts," by E. Quaife (33), is simple and direct, in which the gaze of the youngster is almost uncanny. "How's That, Mummy?" by John Pilkington (48), is a perfect at-home baby picture, in which the portrait of the infant and the composition—helped by the line of the bath—all combine to produce a result that will make an immediate appeal. Another delightful study is "The Secret," by R. E. Scott (73). Here the charm of the children themselves adds to the beauty of the print.

Landscape subjects this year are less in number than usual, but those that are shown have characteristics that make them of high merit. "A Spring Landscape," by Alec. H. Hamilton (4), is a notable example of the open landscape type of subject, in which the strong converging lines of the ploughed earth and the placing of the team of horses are just right. A most attractive print, "Up Field," by J. Krimke (6), which is hung nearby, is another outstanding subject rather akin, and is one of the best renderings of a team of horses and plough with man in charge that has been seen at recent exhibitions. This print should be compared with "Racing the Storm" (135), by A. H. Aronson. Here again the animals are the dominant feature, but the sky is almost overpowering.

Mrs. K. M. Parsons keeps up her high standard of work in her two prints in the first half of the show—"Water Meadows" (10) and "In a Welsh Valley" (14). These are two notable landscapes, which again prove this worker's command of this phase of photography. "Water Meadows" in particular is a subject that would delight the painter, but here the photographer has caught the tonal qualities perfectly, and chosen a point of view that makes a beautiful design. The cattle in the foreground add just the right touch for giving contrast and scale. "In a Welsh Valley" the empty roadway in the foreground curiously does not call for human interest. The picture is complete without it.

"Across the River, Durham," by W. Archer Clark (46), is a departure for this worker, whose name is usually associated with architectural subjects. It indicates, however, that he can be equally successful with landscape. Here is a notable example in which a fine picture has been founded on the beauty of the foreground flowers which dominate the composition.

Two charming little landscapes by A. E. Brooks, "Yarnigale Common" (81) and "The Little Ruined Chapel" (83), are perfect compositions, and the latter has great strength for so small a print. Both are excellent examples of bromoil. G. L. Hawkins presents in his "Forest Fantasy" (101) a new departure for landscape work in pseudo bas-relief and printed in his own process, 'bromaloid.' The diagonal central tree trunk is a trifle over-assertive, but the entire print is very effective.

F. W. Ferguson's "Deep Valley" (102) conveys great space and dignity. The rendering of the subject is helped by the lines converging to a focal point towards the base of the print. Another fine decorative pattern, and with striking lighting, is "Calle en Taxco," by A. H. Aronson (108). The foreground detail is particularly well done, and the cast shadows relieve it from monotony. One of the few prints that shows perfectly the upward slope of a roadway.

J. C. Hooloway's two prints, "Smoke and Grime" (70) and a "Convoy Unloads" (94), are striking dock subjects of considerable strength and well-arranged masses. Ernest Schwitter's "Waterpower" (100) is a remarkable action picture of a rushing torrent with a fine sparkling rendering of movement. Alex. Keighley, with his "The Net Maker" (121), presents another typical Keigh-

ley print of fine composition and good presentation, and Alan F. Taylor's "Silver Trail" (129) is a striking print dependent for its success on the lines and lighting in the water beautifully rendered.

"September Morning," by J. T. Knight (116), is one of those irresistible subjects for the pictorial worker, taken against the light, but this print would have gained by being presented in a warmer tone, and with much more strength in the shadows. We are glad to see A. C. Banfield exhibiting again, and his "Bridge on the Canal" (139) is a charming landscape with much character and feeling. "Gatton," by John Erith (141), is another attractive landscape, although the tree trunk in the foreground is a doubtful addition to the pictorial content.

Among the Animal pictures in the first half of the exhibition a notable print is "Judy," by Dr. S. B. Cooper (9). This is one of the best dog portraits in the show. The expression of the animal is alert, and the posing and technical quality beyond criticism. "Son of T'sioh," by H. V. Bennett (36), is another dog study—a difficult subject but well presented, emphasising the points of this particular breed. "Shetland Sheep Dogs," by Miss E. P. Thompson (111), calls for praise in the dignified arrangement of the group and the simple background. N. A. Scurrah's "Rajah" (92) is a fine tiger study, and A. Bahnsen's "Much Ado About Nothing" (79) is an amusing group of geese, which in spite of the subject and its arrangement holds together extremely well. A. Walden Hammond's bulldog, "British" (76), has considerable possibilities for a propaganda poster.

The architectural pictures, although few in number, are, as usual, extremely good. This type of work usually calls for the best technical abilities of the worker in addition to an appreciation of effective view points. H. C. Hickman's "Until the Dawn" (26) is a notable study, finely presented and dependent on dignified simplicity for its success. A. L. Spence's "Dream in Marble" (41) has good tone quality in the rendering of the architecture but the blackness of the trees is a little too heavy. S. Crowden-Clement's "Gloucester Glory" (50) is a simple presentation of a noble subject emphasised by the luminosity of the sky. A beautiful print.

Reginald Smith's "Old Fribourg" (47) is also a subject of great dignity, but rather lacking in luminosity in the shadows. "Sunlit Pillars," by A. H. Green (77), is a good example of straightforward architectural photography, with a well-chosen viewpoint. Two interior subjects, both familiar in type but both well presented in a decorative way, are "Old England," by S. Lamb (95), and "Old Glass and Stone," by S. C. Scurrah (99).

Two fine pictures by Bertram Hutchings claim attention in this class—"Norman Setting, Winchester" (120), and "Old Southampton" (124). Big subjects treated in a big way with fine technique. H. W. Honess Lee's "Spirit of Serbia" (133) is bold and definite in character, and its severe black-and-white treatment helps the design. Charles Mason's "Mystery" (137) is very impressive, and is presumably a record of sunrise at Stonehenge. Monte Luke's "Eton College" (138) is an Australian version of a peep at one of England's colleges. The point of view was well selected.

Still Life and Table Top work is not so much in evidence as one would expect under present conditions, but E. Heimann is again to the fore with his table-top fantasies in "Lagoon" (11) and "Discretion or Valour?" (15). Both are amusing and both give evidence of imagination and technical skill. "Wheels," by Miss Laura Griswold (20) is an outdoor still-life subject with great beauty in its tonal qualities. This depends for its success on the pattern created by the wheels and their shadow.

"Invitation," by W. C. Squires (39), is an attractive table-top effort, but the diffuse architectural background is not quite right. H. J. Harper-Roberts' "Aristocrats" (51) has the merit of being a credible arrangement, which is not always the case in "domestic" still-life studies of this kind. A. W. Walburn shows perfection of technique in "A Study" (52). The fact that this print is in platinum tends to date it. "Steps to Wisdom," by R. Moxley (107), is a decorative table-top arrangement, although the point of the title is not so clear a statement as "Eggs and Milk," by Alan Cocking (130), which is an almost perfect rendering of a very simple subject. The beautiful technical quality of this print compels attention. "Street Lamps," by H. S. Newcombe (84) is an echo of the past and a reminder of things to come—a well-chosen viewpoint and a strong print.

"Poole Pottery," by A. Royden Willetts (117), is a good straightforward rendering of a simple subject. The arrangement is pleasing and the technical quality could not be better.

Finally, some of the smaller prints in Bromoil Transfer and Gum should be studied for their pictorial qualities. Notable amongst these are "Old Pier," by A. W. Hill (28), a transfer with considerable tonal qualities. "Embankment," by Godfrey Phillips (30)—of fine quality and a good composition; "The House of the Beautiful Lady," by G. Halford (64) and "Bishops' Court," by Alfred Bolton (65), both little gems in "gum" which are largely dependent for their effectiveness on their treatment.

The Second Half

Those visitors who have seen the first half of the exhibition in September will find in the second half, on view during October, another complete show, of equally high merit and in many cases containing further examples by those workers who have prints in the first half.

Again, the proportion of figures and portrait work is higher than that of other subjects: Dr. S. D. Jouhar has another strong example of his work in "An Eastern Panel" (142), which is decorative in treatment, but would have been better if a little more space had been included to suggest a taller figure with less breadth. E. C. Crossett's "Old Spice" (143) is a portrait of considerable character, and with a definite sense of humour. It certainly compels a desire for further knowledge of the model. Two fine character studies by Dr. Julian Smith are "Sono Asato" (153) and "The Patriarch" (161), the latter, a fine rendering of old age, and a shining example of how to deal with flowing white hair. Another portrayal of old age is "Age," by Chas. F. Snow (206). Here the presentation has been helped by the printing process employed.

Two "character" head studies of note are "Son of the Cossacks," by H. W. Walker (160), and "The Exile," by John Dixon (166). Both are examples of good portraiture, with fine modelling. "The Country Gentleman" (147), by H. M. Jackson, is a strongly lighted profile study; the flesh texture and the hair are extremely well rendered. Another good portrait, which is singularly reminiscent of a famous painting, is "Serenity," by Stuart Taylor (156), a very thoughtful piece of work. "Le Beau de XVI^e," by G. Scott Bushe (200), is a good presentation of an actor in character.

S. M. Swenson, in his picture, "The Hostler" (153), achieves an almost stereoscopic effect. The setting for the figure looking out of the open window is most attractive, and the print is an excellent character study. "Invocation," by A. Aldington (173), is also a fine rendering of a subject that might easily become banal. The author has, however, handled the subject with considerable skill, and perfect technique adds to the picture's charm. "Paleo Amaya," by Stuyvesant Peabody (212), is a striking character study, full of life and vitality, and good technical quality.

"Monday Morning," by Allan Cocking (229), is alive and fresh in treatment. The ribbons of the washing on the line, however, tend to introduce a slightly distracting element. Another portrayal of a figure engaged in domestic duties is "The Craft Worker," by Dr. L. M. Hampson (231). Here is a deliberately considered decorative effort, in which the spinning wheel forms the motif.

C. T. Baker gives us yet another example of his action pictures in "Kiltie Girls" (245). This print is as lively as any by this particular worker, but here the rendering is too much on the hard side. An effectively rendered figure is "The Pilot," by H. J. Schmidt (262). Here the man and the wheel appear to be authentic, and for that reason they make the picture all the more convincing. Of the outdoor figure studies, "Harvest Time," by John Milner (148), is a delightful print with the figures well posed. "Les Moissonneurs," by L. Rochiele (211) is an interesting group. The print has fine tones, and the lines of the picture all lead up to the central point of interest in a most effective manner. Two further outdoor studies are "The Village Church," by F. F. Blumfield (193) and "A Wayside Refresher," by C. K. Richmond (195). In both cases the figures are admirably portrayed and arranged.

Other notable prints that fall into this category are "The Handyman," by John Fairweather (275), "Boy and Atlas," by W. G. Briggs (164), "Howdy," by G. Newman (186), and "Norah Sandeman," by Harold Frye (187). Mr. Briggs' picture is a little on the hard side, and the tones of the face of Mr. Newman's model are rather too low and the shadows muddy. Mr. Frye's contribution is a fine example of professional portraiture, the hand on the 'cello being particularly expressive.

Amongst the pictures that come definitely under the classification of "portraits" perhaps one of the finest in the show is "Florentine," by Mrs. Rosalind Maingot (202). Here the flesh textures are superbly rendered, with beautiful massing. In "Cecilia" (198), Mrs. Maingot's other picture in this half, the model is charmingly posed, but there is some lack of modelling in the face.

Mr. Harold House gives another example of his technique and tone renderings in "The Lady Abbess" (238). Here is great concentration of interest, and the rendering of the black hood against the black background is particularly well managed. Two notable "named" portraits are "Frank H. Mason, R.I.," by Walden Hammond (152), and "Assistant Group Officer Fraser, N.F.S.," by John Bardsley (224). The former is a convincing likeness of the well-known seascape artist at work, whilst Mr. Bardsley's model, although different in character, is equally well rendered.

Very characteristic of the subject portrayed, namely, an old-time photographer, is R. G. Fennah's "An Old Hand" (239). This print has fine textural and tonal qualities throughout, as also

has H. Bryce Thomson's "Self Portrait" (241). The President of the Twickenham Photographic Society, Dr. S. D. Jouhar (249), has been well portrayed by Reginald Ward.

Some delightful child studies occur in the second half of the show in addition to those in the first half. Nude kiddies always make excellent little models, and "Jack in the Box," by J. D. S. Hearder (157) is a notable example of this type of subject, and shows what the miniature camera can achieve. Another intimate "at home" picture with nice lines is "Grin and Bear It," by F. C. Hunot (232), which has rather more action than is usually presented in "bath tub" pictures. "Awakening," by A. E. Brookes (175), is another appealing child study, in which a certain amount of hand work can be forgiven.

"Boy with Puppy" (221) and "Battledore" (190), both by Marcus Adams, are two more examples of this worker's typical style. "Mischievous in the Making," by A. G. Brownlee (250), is an entirely satisfying "boy" portrait that the title fits perfectly, but the general effect is discounted by the yellow surrounding mount to the print. Another expressive picture is "Christie," by Miss Lola Stone (172), where the "puck-like" expression on the child's face has been admirably captured, making the whole thing very alert. There is one other "Little Imp," by Miss S. Buyskes (225), which would, however, have been improved by the omission of the bow on the child's hair. A portrait with a sunny effect is "Boy from London," by W. K. Chadburn (219), in which the cast shadows of the child's curls help to add vivacity to the portrait.

Although with a very different theme, two prints which are notable for the expressions on their models' faces are "Far away in a Fairy Tale . . ." by Dr. J. H. Wilding (150) and "What's That?" by H. Bryce Thomson (237). The child in Dr. Wilding's picture is the same as in his print in the first half, No. 34—"Young England," but in this rendering the pose is better, and it is the extraordinary expression of the child in Mr. Thomson's picture that compels attention.

Other child studies that must be noted are "Childhood Joys," by S. H. Clarke (194), and "Child Study," by A. J. Heal (238). Here the texture of the little model's satin dress and flesh tones are outstanding, and the print gains considerably by its background. "Afternoon Nap," by G. Wakefield (176) is a delightful sleeping baby picture, in which also the texture of the satin coverlet is notable.

"Invasion," by Harry Day (207), shows a child looking up at a stormy sky, which is well portrayed. The rendering of the little darkie's skin texture in Mrs. D. D. Wagner's "Wishful Thinking" (191), is admirable, and the pose and expression of the little one have also been well portrayed. A good arrangement is seen in "Tam o' Shanter," by E. Broomer (251), but the effect is spoilt by the inclusion of the white bob on top of the tam o' shanter. Possibly, however, one of the best child pictures in the show is "Jeremy," by Arnold Longman (177).

The Exhibition also contains several good groups, of which one of the best is John Ward's "Thriller or Romance?" (233). This portrays in a very clever manner the interior of a lending library, in which the reading figures have been extremely well caught. Two fine outdoor groupings are "El Venedor," by C. B. Atwater (242), and "The Reckoning," by F. Weston (243). The former is effective, but it is difficult to grasp what the man is selling. The little group round the mounted man in the latter is most attractive. Another grouping is seen in Max J. Shapiro's "Port au Prince" (279), where a brilliant and sunny foreground group make an unusual arrangement.

Whatever the visitor's personal feelings may be as regards nude studies, he will be bound, if he is honest, to admit that those shown here are all first-rate examples of their kind.

To deal first with the male nudes—"Sentinel," by Donald S. Herbert (208), and "After the Discobulus of Myron," by Anne Jackson (252), are subjects not dissimilar in treatment. The first is an excellent print, with fine photographic quality, but rather suggestive of the studio, particularly in regard to the background. Miss Jackson, in her print, has caught the pose of the original very well indeed, but the print itself is a little too low in tone. In "Silent Waters" (162), Anthony Peacock presents us with a typical specimen of his work, the atmospheric effect and the technical quality both calling for praise.

Other nude studies worthy of note are "Nocturne," by John Fairweather (222), in which the model is very pleasingly posed, with reticent shadow treatment, making a very attractive design. Mr. Staniforth's "Mural" (278) is rather lacking in tonal qualities, but the arrangement itself is good. Anthony Peacock's "Interlude" (181) seems a little pointless. Nevertheless, it is a good print with fine tones. "Pause," by C. S. Gerrish (217), is rather too low in tone.

One of the finest action pictures in the show is "Stallion," by A. G. Rigo de Righi (144). This picture has all the quality of a carefully composed painting seen and presented in the grand manner. Ducks and geese seem to attract certain pictorial workers, and "We Are Seven," by A. H. Aronson

(240), is an extremely well-arranged group of geese, strongly lighted and clearly defined, whilst E. W. Chadwick's "Ducks" is another busy group, with the water brilliantly rendered.

As previously mentioned, there are less landscape subjects than usual this year, but perhaps this tends to make those that are exhibited all the more appreciated by lovers of this class of subject.

Foremost amongst those to be mentioned are two by Mrs. K. M. Parsons, which call for further praise, "Pasture into Arable" (145) and "Beyond the Summit" (149). No. 145 in less capable hands would have been patchy and feeble. Here the lines tend to strength and serenity. The second print is simple and bold in character, with a very definite point of emphasis.

There is a beautiful sky in "The Silver Lining," by F. W. Ferguson (258), and another fine print is "Welsh Hills," by E. Hadley (260), the arrangement of the subject, and notably the placing of the sheep being particularly successful. One other outstanding mountain landscape is "Evening on the Grimsel," by A. E. Gnaegi (165). This has very attractive lines and first-rate technical quality throughout. The well-shaded foreground emphasises the distance, which is admirably rendered.

Two further landscapes of first rate quality are "Rainbow Weather," by R. L. Shaw (188), a remarkable composition of painter-like quality, and "Heaven's Spotlight," by Will Till (158), a typical South African landscape, with the usual full tonal qualities that one expects from this worker. G. L. Hawkins uses gum as a medium for his "tree" picture, "Trunks" (280). It is a fine print, but the subject is one that could have been done greater justice by presentation on a larger scale. A much bolder "tree" picture is "Wind Witch," by Mrs. Mildred Hatry (201), where the striking tree outline has been made the most of in the production of a picture of outstanding strength, although lacking, perhaps, a little in middle distance. Fred Judge's "Dartmoor" is another subject that would have been better treated on a larger scale, but "Church with Cloud" (255) and "Farnham Castle" (256), by Alfred Bolton, also gum prints, are of good colour, and also well chosen subjects.

The fascination of sand ripples left by the receding tide is usually irresistible, and Mrs. Dolce Rowan has made a very good job of their reproduction in her "Low Tide" (210). The whole thing is just a trifle on the dark side, but nevertheless very decorative. The mill in "Tower Mill, Yorks," by Dr. S. D. Jouhar (223), finely placed in a rather sombre landscape setting, is slightly over-emphasised. But this is possibly permissible in view of its dramatic possibilities. There is fine atmospheric effect in "Rain in Glencoe," by R. E. Booth (270), and another good subject is "The Bower," by L. G. Rachiele (167), although the curious shadow pattern in the foreground is inclined to be a little irritating. "Spring is Coming," by Dr. B. J. Ochsner (268), showing three young maidens dancing in the open air is a dainty little fantasy, with nice tones. All that need be said of "Bracken Harvest, Malham," (264) is that its author is Alexander Keighley!

Snowscapes again take an important place in the exhibition as a whole, and those that are shown in this half of the exhibition are all prints of exceptional quality, and notable for their exceptional tones. The perfect tone rendering in Mrs. Alice Schuftan's "Alpine Farmhouse" (174), makes this a most attractive picture, with the sky emphasising the beauty of the snow on the trees. "Snow on the Top Field," by T. H. Breakell (170), is also a good print, in which the most has been made of the pattern of the ploughed field under snow, but one wonders why there is no trace of snow to be seen anywhere else in the landscape. A beautiful rendering of snow patterns is also seen in "Outposts," by G. B. Kearey (171), and in "Lake Sentinels," by G. D. Greene (247), the rendering of the snow is outstandingly good, although the presence of so many twigs tends to be a distracting factor.

Two prints of particularly pleasing colour are "River's Edge," by A. E. Coleman (182), a good skating picture with well-placed figures, and "After the Storm," by S. M. Swenson (183). In this print the rendering of the snow is perhaps a trifle heavy, but the composition is most pleasing, with lines all leading to the house and the tree. "White Paradise," by G. L. Hamburger (199), is yet another fine example of snow rendering, with nicely-placed figures. A Fassbender's "Bunny Steps" (178) makes an attractive pattern, from unsuspected material, in which the tone qualities throughout are perfectly done, with the interest concentrated in just the right places. The tonal rendering of "Frosty Morning," by Dr. B. J. Ochsner (179), however, is not entirely ideal for the subject, although quite beautiful.

As may be expected, the number of seascapes this year is comparatively small, but those on view are all first-rate examples of this type of work. In particular it is good to find that H. C. Hickman has followed up his "Off St. Ives" with another fine high key picture, and worthy successor "Silver Morn" (169). Two yachting pictures, reminiscent of pre-war days, are "One Reef Down," (230) by F. W. Beken, and "Seven Sixes" (281), by J. E. Mitchell. Both are good examples of a fascinating

subject, and Mr. Mitchell's picture in high key has all the brilliance and sparkle that one associates with this "sport of kings." The arrangement of the group is very attractive.

The rendering of reflections in water is another theme that never fails to produce an appeal, and the fine placing of the boats under the pier in Adolf Fassbender's "Deep Water" (236) is no exception. Not quite so satisfactory is "The End of the Line," by Dr. G. H. Ludins (259), as the slight spottiness of the rendering of the water tends to take away from its liquid qualities.

"Deserted Beach," by John Erith (273), is a subject of considerable beauty, with the lighting and attention concentrated on the boats in the foreground. One other striking seascape is that showing a silhouette of a windjammer against the setting sun, "Down to the Sea Again," by H. Cartledge (244).

Railway stations are also not frequently photographed these days, but possibly Allan Cocking's "Euston Express" (189) is from a pre-war negative. In any case, it is a fine rendering of an express train leaving the station, with smoke and steam. Unfortunately the light-toned angular patch behind the engine tends to distract from the beauty of the smoke from the engine. "The Conference," by John Staples (192), is a very convincing street corner shot. The figures are well caught and placed, but the expanse of white wall is a little too blank, and tends to weaken the picture as a whole. "Gate to Empire," by J. C. Holloway (246), is a striking dockside picture, with fine atmospheric effect and well-placed masses.

The beauty of the architectural subject will always appeal to certain workers, and good pictures in this class never fail to attract. Those that are seen in this half of the exhibition are all prints of considerable technical and pictorial merit. "Grass Market, Edinburgh," by Lt. Swiecicki (243), is a first-rate high viewpoint picture, in which the verticals have been well preserved. The two small figures at the base of the print are a particularly fortunate touch that makes the arrangement perfect. "Salisbury Cathedral" (226) is also well rendered by F. W. Knight. The Rev. Egerton Ryerson's picture, "Wells" (220), emphasises to the full the beauty of this cathedral's architecture. W. Archer Clarke continues to present notable architectural subjects, and "The Founder's Tomb" (253) is typical of this artist's work. It might, however, with advantage, have been a little less heavy in tone. "Cathedral Town," by J. T. Snyder (146), is a very good example of house-top photography, in this case capped by a distant cathedral, which adds to its charm.

It would be very surprising if amongst the subjects submitted from America there were not at least one "skyscraper" picture that was outstanding. The example that is shown here, "Manhattan Saga," by Ira A. Schur (235), is better than most, and the effective arrangement makes a dignified, but at the same time slightly fantastic, picture. The sky is entirely in keeping, and the tonal qualities throughout are good. The other picture in the show with which one might compare this is "Unconquered," by Adolf Fassbender (214). Here is another finely rendered mass of buildings, with contrasting lines that make for strength and dignity, and which is considerably helped by the sky.

Two subjects in which "sunsplash" play an important part are "Salisbury Old Hall," by J. T. Swarbrick, a beautiful interior, with good tonal quality, all leading up to the noble window, and "Sunsplashed Steps," by F. W. Knight (151). In this case, however, the architecture itself rather overshadows the steps which give the title to the print. Technically it is very good. Lastly in this group we must mention two little gum prints by W. E. Gundill, both excellent in their blacks, and dainty, clean little prints. They are "The Deserted Grange" (271) and "The Courtyard" (272.)

In turning to the still life and table-top work exhibited the visitor cannot fail to be immediately attracted by that humorist of the "table-top," E. Heimann. "The Faun" (159) is another extremely clever set by this worker, in which the background is presumably intended to suggest a forest scene. It certainly provides a lesson on "circles of confusion."

An arrangement of small domestic objects provides the theme for "Long, Long Ago," by E. F. Reynolds (282), and J. S. Waring's "Design" is another excellent arrangement, although it is rather too flat in tone and lacks sparkle. Fruit is generally a very popular subject for the still-life worker, and the examples shown here are all typical. Miss L. Griswold makes the mouth water with her luscious strawberries, truly "Louisiana's Pride" (277), but the rendering is perhaps a little heavy.

On the whole, the outstanding feature of the pictorial section that will strike the observer this year is the remarkably high technical quality of the prints. This is surprising in view of war-time conditions, but speaks volumes for the skill and enthusiasm of the producers of the pictures, and is an encouraging portent for the future.

The Lantern Slides

By G. E. W. HERBERT, F.R.P.S.

THAT it was possible this year to make a selection of pictorial slides exceeding by fifty per cent the number exhibited in 1942 must not be held to imply a higher standard in the work submitted, for not all the exhibited slides are outstandingly deserving of the distinction; and indeed not a few have owed their inclusion to a charitable reconsideration of their merits by the judges after the first hesitating misgivings.

All the same, the result is a varied and interesting collection containing many good things that will well reward a pleasant hour spent in scrutinising the show-case.

But first a word concerning the rejected slides, which numbered some 500 out of a total approaching 650. It was the opinion of the judges that many of these must have been the work of aspirants who could hardly have seen or handled a good slide made by a master—that they had been sent in by amateurs ploughing lone furrows, debarred from the benefit of personal contact with fellow workers, and without much idea of the kind of subject suited to the process. Indeed, it gave one to speculate whether the activities of the Photographic Alliance might not be directed towards meeting a definite need by getting together a few miniature collections of slides of the first order, each limited to, say, a dozen specimens which could travel safely by ordinary letter post, for loan to individual workers for comparison with their own efforts. Exhibitors willing to assist such a scheme are invited to communicate with the present writer.

Among many defects in slides that detracted from chances of acceptance was the ubiquitous pinhole, so remediable by “spotting,” so avoidable if the worker will but make his slide by projection rather than by contact. Having been quite recently converted to the former method, I can, as an old offender myself, speak from experience and with confidence. Another common failing, and a fatal one, was a falling away at one or more of the corners of the slide, due, I suspect, to uneven illumination. Sometimes this falling away ran along the whole edge of the slide, and the fault may have been due to some defect such as uneven density in the negative. In the latter case a little judicious extra printing of the affected part is the remedy. A frequent fault that showed up badly on the screen was the drunken appearance of the verticals in a building, due to the want of both a spirit level and a little care when exposing. Where buildings are concerned, the sin is unpardonable, for however obliquely we may look upon our own moral delinquencies, we do like uprightness in our architecture. Mention must also be made, again with the frown of disapproval, of the tendency to submit slides made by contact from very small negatives. It should be remembered that the majority of visitors to the Exhibition can only see the slides illuminated in the showcase, where a diminutive picture isolated in the middle of a standard size lantern plate has a lost, lone look that suggests it is but some poor relation of the more imposing fraternity around. The remedy is obvious—to make through the enlarger a full-size slide that will stand up proudly among its fellows. A minor fault of technique that has damned many a good slide is the intolerable red tone that results from over-exposing a warm tone lantern plate. A simple remedy is to tone with gold—a simpler is to make a new slide.

Over and beyond technical defects such as these there were a few instances of artistic error, a common one being over correction of values by use of an unsuitable screen. The fatal loss of a sense of space, where space should be, may be due to the same cause or to the use, perhaps, of the short focus lens with its vaunted “great depth of focus.” Such absence of atmospheric perspective robs pictures of mountain scenery of all their wonder and all their mystery and leaves them poor indeed, and the artist-worker who has seen a good subject and photographed it with the all too-efficient modern instruments and accessories whose proper uses he imperfectly understands, would do far better, time and again, were his optical equipment limited to the ordinary single meniscus lens.

The short-comings to which I have alluded occur, be it remarked, chiefly in the rejected slides, but visitors to Prince's Gate who like to look for faults will assuredly find just a few among the slides exhibited. Nevertheless, the collection is a good one, far richer in variety than might have been expected in war-time, and comprises many excellent specimens that deserve special mention. Few, if any, owe their existence to the circumstances of the war or reflect its reactions on the life of the nation, and workers have been content to ring the changes on the old themes that never lose their appeal and are ever open to freshness of treatment. Such diversity is well exemplified in the baker's half-dozen contributed by Mr. J. S. Waring, including as it does, pure landscape, archi-

itecture, figure studies, genre, table-top and still life. Of them all, I choose for mention the last, "Earthenware" (399). Like the poet, Mr. Waring exercises his art in "common things that round us lie," and finds good in everything and beauty everywhere.

In the realm of pure landscape, Messrs. Snelson and Squires, both of Cambridge, have each half-a-dozen pictures of those homely little bits of the open flat East Anglian country which so many of us, seeking subjects more romantic, would pass by and fail to see. One cannot commend too highly the delicacy and restraint of a Snelson sky. Typical slides are "Elsworth Lane" (523), reproduced, and "Reach Fen" (404). Mr. W. A. Poucher, whose heart is in the higher lands, is represented by half-a-dozen of those slides of mountain scenery that have gained him much repute. My choice is "Bristley Ridge" (470), with its very suitable figure, doubtless posed, but admirably placed and entirely in keeping. A landscape that will attract many is J. P. Delaney's "How Green was my Valley !" (505). And how exquisite, we should like to add, was the dreamy middle distance thereof !

Captious critics might take exception to the intentional "fuzziness", as they would term it, of one or two of the pictures, witness Mr. Lawton's "In the Kanderthal" (463), and Mr. Squire's "Misty Morn" (403), forgetting that slightly soft focus even in a lantern slide can sometimes have its own distinctive charm by virtue of which the imaginative spectator sees in the picture more than meets the physical eye. Indeed, does not the successful appeal of any picture lie in the eye of the beholder, rather than in the artistic ability of him who made it ? A similar reaction follows such a slide as Mr. C. D. Milner's "Last Gleam" (497)—the fading light just touching a group of trees backed by a shadowed hillside—almost Dantesque in its sombre mood of gloom.

Portraits of childhood come next within our survey. Miss Alice Jackson is well to the fore with some studies in high key, and "The Rogue" (424) shows her to be an adept in capturing happy expressions in this field of photography. A good second is Mrs. Blenkhorn's felicitously-titled snap, "The Snob" (458). Yet another excellent child study is "What's That?" (483), by H. Bryce Thomson—an alternative title to which might well be "We Are Not Amused."

Of figure studies among somewhat older juveniles we may instance G. F. Harris's group of happy youngsters at play in "Sunshine Alley" (518) and Mr. W. Gregory's boys playing "Conkers" (529). These have been carefully posed and given a place in the sun, although the game lacks the vim it would have possessed had it been caught unawares. Some strong portraits are shown by H. M. Jackson, the quality of whose "Skipper" (451) is close run by a picture from the same model, reduced for the nonce to the status of a mere "Fisherman" (453). Men at their work are always a fruitful field for the art of the lantern slide, and here we may note Mr. Waring's "Flame and Smoke" (397) and W. A. Hooker's "Cobbler" (530)—a fine pair of action pictures.

In portraiture of the gentler sex, Mrs. Rosalind Maingot maintains her unrivalled ascendancy with her begowned beauties dressed in the fashions of a bygone day. She has beautiful models, it is true, and an ample wardrobe of silks and satins rare, but what consummate taste she displays in building up from these her exhibition pictures that appeal to everybody ! Herrick, we remember, was unable to remain insensible to the same charm of feminine attire.

*Whenas in silks my Julia goes,
Then, then (methinks) how sweetly flows
That liquefaction of her clothes.*

*Next, when I cast mine eyes and see
That brave vibration each way, free :
O how that glittering taketh me !*

We choose for special praise (and reproduction) "The Palmist"—the real theme of the picture being its wonderful concentration of interest (440).

The perfect setting for such elegances would, of course, be one of those interiors of the "Stately Homes of England," to which Edgar Bull has devoted his mastery of lantern slide technique, such, for instance, as "The Queen's Room, Penshurst" (393), with its delicious peep into another room beyond. Straight architecture, with its insistence on all the enchantment that soft sunlight can bestow, is represented by some choice work by Bertram Hutchings (475), F. J. Jones (441), and that veteran of many exhibitions, V. E. Morris (508).

Animal studies make a strong bid for our attention, and among these we greatly fancy Mr. Scurrah's "Rajah" (431)—the tiger whose "soft underbelly" some would wish trimmed away in order to concentrate attention on the animal's superb head. A good second is "Her Grace" (432), by the same worker—one of the loveliest swan photographs we have seen for many a day. Mabel Oliver is again to the front with some dog studies. The rich tone and obvious friendliness of the subject makes "Bob" (433) our favourite.

Still life is represented by many fine specimens. First among them I would place No. 447, by Mr. H. J. Harper-Roberts—a noble cauliflower with an intriguing entourage of mushrooms, perfect in texture and modelling, to say nothing of the appeal they make in these lean war-time days to our grosser senses. In the same category comes Mr. W. J. Foster's study of "Onions," whose imparted odour in earlier days of wartime scarcity was considered the hall-mark whereby a "real gentleman" might be detected. But may we not remark just a soupçon of boastfulness in their title, "Home Grown"? (449).

A very remarkable trio of slides, distinctly out of the usual rut, are the three brilliant ballet scenes, contributed by that Recorder of Terpsichorean Revels, Mr. J. T. Knight, specialised work that could hardly be excelled (413 to 415).

Nudes seem to be out of all favour this year, despite the tendency in that direction proceeding from shortage of clothing coupons; for there is but one—Dr. Jouhar's "Standard de Luxe" (494). This very graceful female figure, supporting a lamp, might well be the model for a charming figurine.

Space precludes more than a mention of one or two other slides that have pleased me—Mr. Burdus Redford's snow picture, "Sunshine" (427), Mr. C. A. White's "Currants" (450), Mr. C. W. Milner's fine "Cragsman" (506), Mr. B. Garth's "Glass" (425), Mr. G. F. Harris's "Still Life" (479), and Mr. Gaisford's "Old Cutler" (484). And with these I close this brief survey of the pictorial section of the lantern slides.

Nature Photography

By OLIVER G. PIKE, F.Z.S., F.R.P.S., F.I.B.P., M.B.O.U.

THE exacting standard of workmanship demanded by the Society in the Nature Section, has given us another fine show of photographs of those denizens of the woodland, field and shore that appeal to the sporting instincts of those workers who devote most of their spare time to this fascinating hobby. One encouraging thing I noticed is, that those who make a point of sending in their best work season after season, do not seem to flag in their efforts, and considering that the war has placed severe restrictions against visiting many of our best-known bird haunts, the results obtained are remarkable. As far as bird photography is concerned, these restrictions limit the work of many, and there are also several who, although busy with war duties, still manage to be represented.

When we look at the great variety of subjects shown, we realise that nature photography will always have its followers. Each year new exhibitors send in their work, but many of these do not seem to understand what is the required standard, or maybe they have never visited an exhibition of high-class photographs, for their prints would not have a chance of being accepted in any beginners' section. Others who have been fortunate to have their work hung in the past, show how, as the seasons pass, they improve, and this is always gratifying.

The section as a whole is more equally divided than on many previous occasions, usually photographs of birds predominate, but this year they are only one-third of the total, leaving flowers, fish, insects, mammals and fungi to be well represented.

The most striking flower subject, No. 297, by H. Gernsheim, is a set of seven prints of the dandelion, first showing the full flower viewed from above, followed by the several stages to the seed freed from its "parachute," the whole being a vigorous set of enlargements of the most perfect technical quality. Nos. 356-7-8 are three lovely pictures by Miss Anne Jackson, these greatly attracted me, the white blossom of the Bramble and Elder, and the golden star-like blooms of the Stonecrop are beautifully rendered, with full detail in the surrounding shadows. E. J. Bedford shows a good print of Moon Daisies, No. 300, but his "By the Stream Side," No. 305, appeals to me most, for this is the style of picture that has made his name so well known in the flower and photographic worlds. No. 299 is a bold picture of Foxgloves by Mrs. K. M. Parsons, and is one of those photographic studies that I felt I could live with if it were placed on the walls of my room.

Douglas P. Wilson has four prints, Nos. 349 to 352, in which we see marvellous examples of camouflage, also a very good shot of a shoal of Mackerel swimming past; another attractive fish study is No. 337, by that expert of under-water photography, W. S. Pitt.

Amongst birds there are quite a number of photographs from that wonderful wild life sanctuary, Hickling Broad, and we see how several workers have used the same hide. It is interesting to com-

pare the results obtained by Eric Hosking, Ian Thomson and Stuart G. Smith. The shots of that rare, but much photographed bird, Montagu's Harrier, by the two former are the best I have seen. Both were fortunate to obtain shots of the male and female together at the nest, and we see the striking difference in the plumage of the two birds; the old naturalists were so much puzzled by this that they were set apart as different species. The weather conditions were different while these two workers were exposing, for Ian Thomson's were taken in the shade, and Eric Hosking's in sun, but both have achieved very perfect results. These two also exposed plates by flashlight on the same Barn Owl, and of the two prints I like that by Hosking best, for it shows the three young, while in Thomson's print they are partly hidden by the parent, but both are fine examples of flashlight photography. Hosking also has a very bold print of the Barn Owl standing in an opening in the wall of the barn, and the white bird against the jet blackness beyond makes a striking subject. The Nightingale, made so popular in recent years by the B.B.C., is shown in two prints, one by John Markham, the other the work of Ian Thomson. The latter is interesting from the fact that it shows a characteristic attitude of the bird with raised tail.

The medal of the Society is usually awarded to those photographers who for several seasons have shown prints of high quality in their special subjects; this year John Markham and G. B. Kearey are the recipients; the latter is a versatile photographer, and has excelled in almost every branch of photography that he has attempted. Kearey's Merlin, No. 354, gives a fine rendering of the plumage with that softness that I so much admire in bird portraits. Markham's Dotterel, No. 307, Hen Harrier, No. 328, and Ptarmigan, 329, are all fine technical work. Stuart G. Smith has an interesting set of three prints of the Meadow Pipit, No. 303, showing nest sanitation, also a good print of the Bearded Tit, No. 295, another shot from the Hickling Sanctuary. C. W. Teager, whose exhibits last year attracted so much attention, again shows two prints of the same subject, a Starling and Blackbird bathing, Nos. 326 and 321. The Starling is in a grotesque attitude that no artist would dare to portray.

Two shots of flight by J. S. Barlee are distinct in their class, the Kittiwake Gull, No. 313, is one of the best flight photographs I have seen for a long time, his Heron, No. 334, lacks the detail shown in the Gull, but is a good action photograph.

The Coot, with its almost black plumage, is not an easy bird to photograph, but W. W. Nicholas in No. 288 has succeeded where many have failed. We always expect good work from G. K. Yeates, and this year I am not disappointed, for his wren, No. 284, Sparrow Hawk, 285, and Bittern, No. 286, are all perfect examples from technical and ornithological standpoints.

There are few Zoo subjects, but what there are are good; Lion and Lioness, No. 310, by A. C. Banfield, greatly appealed to me. It is a happy family shot, with splendid lighting and posing, the massive head of the male is a great contrast to that of his mate. R. G. Fennah, in his print of a Calithrix Monkey—male, has cleverly rendered the coat of his subject with a softness that is often absent in captive animals. John Lomax, in No. 369, has a fine study of a Lion's head. T. O. Rutledge, who in the past has done such excellent work among Badgers with flashlight, shows another shot of this mammal, one of his best.

The wild mammals are represented by a print of my own "They've all got a mate but me," No. 359. There were nine young rabbits in the burrow, and while waiting for the whole family to appear, this shot presented itself, and I made the most of it with my miniature camera.

Entomology is well represented. H. J. Howard in No. 333 shows four studies of moths at rest on trees, and they are so perfect from a photographic standpoint that the fine down on their wings and bodies appears to be real. The three sets of prints by S. Beaufoy, 317-18-19, have, if it is possible, eclipsed his previous efforts. I have the greatest admiration for the work of this photographer, for he shows that he is an expert in the many branches of photography which have to be brought into play to obtain his life stories of the insects. Vincent J. Watson shows a good series of the Elephant Hawk Moth, No. 335, and Gordon Woods, in Nos. 322-3-4-5, four shots of moths, which I thought appeared to be over enlarged. A small set, which must not be overlooked, for it is a subject that is important at the present time, when we are all endeavouring to obtain the best crops from our fruit trees, is by Ranald Rigby, No. 342. This is a clever series of that bugbear of apple growers, the American Blight, shown in all its stages.

Fungi treated properly always makes attractive subjects, and there are several excellent examples. I specially like H. J. Howard's exhibits. "The Beautiful Horn," No. 339, has a fine lighting effect. Those by Miss E. Mason of the "Lawyer's Wig," No. 336, in a series of five prints show the various stages of growth of this interesting species.

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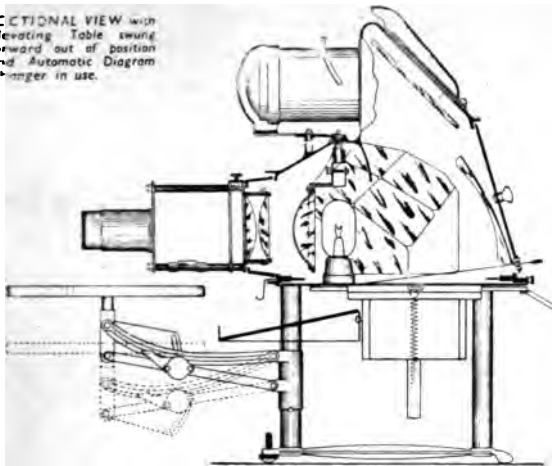
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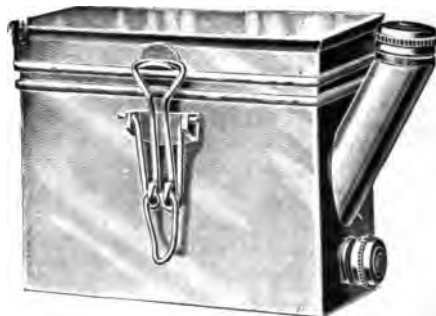
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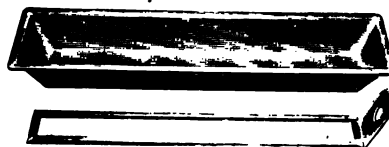
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PHOTOGRAMS OF THE YEAR



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LECTURE PROGRAMME

Tuesday, September 21st, 6 p.m.
Meeting arranged by the Scientific and Technical Group. (1) "A Problem in Industrial High Speed Photomicrography." By R. S. Allan, B.Sc., F.R.M.S. (2) Demonstration of Eastman High-Speed Camera, Type III.

Wednesday, September 29th, 7 p.m.
Films by Members of the Federation of Cine Societies. Programme arranged by T. S. Lutas, A.R.P.S.

Tuesday, October 19th, 6 p.m.
Meeting to be arranged by the Scientific and Technical Group.

Saturday, October 30th, 3 p.m.
Meeting arranged by the Miniature Camera Group. "Experiences with the 2 1/2 in. square Miniature Camera." By Bertram Hutchings, F.R.P.S.

Saturday, November 6th, 3 p.m.
Meeting to be arranged by the Colour Group.

Saturday, November 13th, 3 p.m.
"Spanish Architecture." By J. R. H. Weaver, M.A., F.R.P.S.

Saturday, November 20th, 3 p.m.
Meeting to be arranged by the Kinematograph Section.

Saturday, November 27th, 3 p.m.
"Meditations and Recollections:

Fifty Years of Photography." By Charles Eshborn, A.R.P.S.

Saturday, December 4th, 3 p.m.
Meeting arranged by the Miniature Camera Group. "Review of Literature and Developments of Interest to the Miniaturist." By Percy W. Harris, F.R.P.S.

Saturday, December 11th, 3 p.m.
The Traill Taylor Memorial Lecture. To be delivered by E. R. Davies, B.Sc., F.R.P.S.

Saturday, December 18th, 3 p.m.
Joint Meeting of the Scientific and Technical Section with the Association for Scientific Photography.

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